

Commodore **HORIZONS**

The Independent Commodore magazine

July-August 1984

**BITSWITCHING EXPLAINED • FLIGHT SIMULATOR
UTILITIES AND LANGUAGES REVIEWED**

EXPLORING THE NETWORKS



**WIN £500
WORTH OF
NETWORKING KIT
FROM MICRONET**



SUPERSOFT

the name to remember

for games

For only £8.95 you can buy a game that's exciting, scathing, and frustratingly addictive – all at the same time! SBC looks so different and sounds so different from all those other games that it will seem like being in another dimension when you sit down to play.



SBC £8.95



SBC £8.95



SBC £8.95

for business

Show your computer who's master with BUSCALC! Spreadsheet programs are used by large and small businesses to juggle with figures, prepare reports and so on. Some are very powerful indeed. The problem is that they're difficult to learn, and tricky to use – which is why we came up with the BUSCALC series.

Whether you choose BUSCALC 1, BUSCALC 2, or BUSCALC 3 you'll get a program you can understand – and one that almost seems to understand you. Use it in the home, use it for teaching, use it at work – it'll save you time and money.



for programmers

MIXED is a full 6502 8080 ASSEMBLER with the power that professional programmers need, yet so simple to use that we recommend it to beginners. The MIXED cartridge has many other facilities including editing commands and a machine language monitor, all for £37.50.

There's much more for the 64 in the SUPERSOFT catalogue. Ask your computer dealer for a copy, or phone 01-841 1166.



The Best Software

SUPERSOFT, Winchester House, Canning Road, Wokingham, Hants RG4 7SA Telephone: 01-841 1166

Commodore HORIZONS

Editor
Brendan Carr

Assistant Editor
Christopher Jenkins

Editorial Secretary
Catherine Smyth

Group Advertisement Manager
David Lake

Advertisement Manager
Jeremy Kim

Administration
Thomas Lutz

Managing Editor
Duncan Scott

Publishing Director
Janey Ireland

Teleguide Number
G41 41940000
00-407 4140

UK address
Commodore Horizons, 12/13 Little
Pearson Street, London WC1R 3LD.

US address
Commodore Horizons, c/o Bureau
Press International, 308 East 42nd
Street, New York NY 10017

Subscriptions:
UK £8.95 for 12 issues overseas
surface (including US and Canada)
£18.00 for 12 issues; US and Canada air
mail £18.95 for 12 issues

Submitting articles
Commodore Horizons welcomes readers' contributions — either articles or system feature articles should be typed double-spaced with a wide margin. Programs should, whenever possible, be printed out on plain white paper, accompanied by a cassette. We cannot guarantee to return every article or program submitted, so please keep a copy. If you want to have your program returned, you must include a stamped, addressed envelope.



SUNSHINE

Commodore Horizons is published monthly, by Sunshine Books, Ltd. Printed by Reynolds Press, Ltd, Thame Way, Wokingham, RG40 3ET. Distributed by BBC Distribution, 30 St. Martin Lane, London WC2R 0PH. Telephone 01-474 9071. Telex 304441. ISSN 0264-4341. Registered at the Post Office as a newspaper.

© 1984 Sunshine Books Ltd.

CONTENTS

Letters

Good news for ham radio, here, a plea for powerful software from the Play for Life group, and more readers' news and views

News

Reports from two major shows — the 5th International Commodore Show in London and the CES in Chicago, plus the latest software and hardware

Games software



First Grand Prix to now depicts what he sees. Submarine Commander, and the 16-bit Atari's 64 monitors and monitors

Business software

Mike Green looks at spreadsheets — will they save you money by spending on spreadsheets, or are they just an expensive hobby?

Puzzles

Karen Neveu looks at a number of programs which make a game to use your 64 — for programming, puzzle, filling, using graphics and more

Profile

Chris Ashton talks to John Clark of Computer and the look of business about their first network services — which should you look up with?

Hardware

Have you joined in a night pilot? Try William Hays's flight simulator for the 64 and find out if you have the skill to land in the dark

Video characters

Using this straightforward program you can generate the data statements necessary to give your Commodore 64 a character set facility

Bit switching

If you don't know what bit switching is, you're missing out on an important programming concept — read this article for instant illumination

Software file

It starts here — the latest Software File news, with games and software news for the 64 and the Vix 20, both expanded and with Super Expansion

Believe Me on the 1341

The 1341 disk drive is not the easiest peripheral to use — this article gives you the programs and instructions you need to get it under control

Answer book

Technical expert Jack Cohen copes with most of your programming and hardware queries, including character sets, package collection and machine code

Competition

Macromart offers three lucky readers the chance to win systems for the 64, with a year's free subscription to the new Macromart, all network services

EDITORIAL

REDLASH ON BLESS — it's not a matter of time. It's also a matter of where you're standing. No, this isn't a theological reference, nor is it an introduction to a discussion of the finer points of philosophy. Instead it's a reaction to the June Commodore show.

The Macromart Hotel isn't the most striking of buildings. The place is surrounded by a luxurious security system and the entrance suggests that it is back to a vast car park rather than an upstairs hotel. The show itself occupied two large halls. Striding between the two, Commodore users tramped against the hotel's most exclusive clientele of time has, in the company of the mainly American and Japanese visitors waiting to embark on the next stage of their package tour. The Commodore staff who stayed on the hotel from setting up on Wednesday to dismantling on Sunday night deserve your sympathy. Not only did they have eight of the people next to the discussion, but they had eight of each other as well, communicating by walkie-talkie instead.

Conversation at the show was the norm of the two halls as Radio Luxembourg plugged it out with the likes of Audioverse, Llamasoft and Bubble Bus. The left exhibitors with speech synthesizers looking for magazine exposure too, but certainly grabbed the attention of arcade fans. Llamasoft provided was so rare as an unpopular game from Llamasoft.

Unusually was the quietest end of things (and not just because we were there). Surprisingly, despite all the surrounding hi-tech competition, the most popular stand here was a computerized version of numbers — numbers don't have enemies. But the hardware stand upstairs was the new Commodore market, although it was the peripheral which attracted the most attention from Commodore owners. The Plus 4, which breaks away from Commodore's customary clumps for home users, comes with a range of matching peripherals. They're all very nice, bearing a passing resemblance to the Commodore range. More importantly, the disk drives are four or five times as fast as the 1341, and are said to be compatible with the 64. So if you own a 64 you'll lose in terms of matching discs, but you'll gain in speed.

This should bring a dash of relief to disk users — and an end to the old tradition of turbo-loading cassettes being faster than disks.

LETTERS PAGE

German ham

PERHAPS you could pass on the following information to Steve Bailey (May '84) and all other "hams" with Commodore computers.

Station G4A FRL, Operator Helmut Isenberg, has programs for the Vic 20 and the 64 — an article on them — without charge — appeared in the first edition of a new German magazine called "h4m" in April. The program allows for transmission, reception, CTJ call, test, timing to tape, transmitting from tape and automatic taping of messages. Made of transmission is ETTY.

Give Helmut a call, and you'll probably get all the information you need.

Note in a comment. Are there any UK readers who'd like to exchange letters for the Vic 20 for letters (for Vic 20 44) published in German magazine?

I'd be pleased to hear from those who'd like to add a few new games or utilities to their collection. Likewise I would

be pleased to receive program listings for music or graphics on the Vic 20, as well as utilities for machine code programming.

Incidentally, Commodore rates in the UK should be checked that software prices are — compared with German prices — almost ridiculously low, the average price for a game is about five being about £15 as games exchange sites, and work very few copies — usually superior British programs — of cassette being available (see David Perry Pioneer, Eggenstein 29 David Grossen-See W Germany).

Window no-go

I OWN A 64 and wondered if you could give me some help with a short program to create a window of four lines which would sit on top up — as in the window in The Hobbit.

A J Molyneux
West Marnham
London

THE BEST way to do this is to set up a split screen, with graphics in the top half and text below. Unfortunately this requires a complicated machine code program, and

can't be done in simple Basic.

CompuThink again

COULD YOU put me in touch with Mr B W Gregory, who had a query in CompuThink, done in the Answer Book section of the June Answer Book?

I have a CompuThink Think Commodore Robot (201 158K GT1, F2) which, in conjunction with your advice, should solve my problem.

A McClean
101 Todd Lane North
Lakeland WA
Preston
Lancs

NE CURIOSITY — are you and Iain? Since we don't have a record of your address we've posted Mr McClean's in the hope that you'll be able to take advantage of his kind of help.

Lively play

PLAY FOR LIFE is an organisation for promoting cooperation between parents, teachers and the top track and industry to create life-affirming playthings for children.

Play for Life is currently compiling a guide, and it is intended to include a section on computer programs. Our primary concern is for playthings for the five to twelve year olds, but our interest extends to children of all ages. I would be most grateful if any software houses who feel they publish suitable programs would send me these.

The criterion for inclusion is that the programs should be constructive, creative entertainment. Thus we are looking for utilities that encourage the users to extend themselves, and their imaginations. Graphics and music utilities are excellent examples.

The sort of games that we're looking for are: may be harder to qualify, perhaps because there are so few of them? Also, saying, despite playing games are definitely out. Documental power word games are similarly excluded. A lack of overt violence is no qualification, nor games may still be aggressively competitive. So what are we looking for? Simulations that deepen understanding, role play games where the player helps others, word games that encourage communication and word reaction, but not if they depend on or include violence and aggression, and how about multi player games that require the participants to work together?

We are greatly encouraged by the increasing media interest in Play for Life. Its first meeting in February received extensive sympathetic coverage on BBC Radio 4 and positive interest has been already shown by some of the quality press, not only in the Play for Life edition, but also specifically in appropriate computer software.

Keith Oller
Moulton
Goldsmith Avenue
Chorlton
Salford

This is the chance to win your ideas — send your tips, comments and suggestions to Letters Page, Commodore Magazine, 12-18 Little Newport Street, London WC2N 6LN

"Rock My Steel of Hardware
meet Eddie Sponge in
Software!"



PC and Z seen

COMMODORE'S plans for the business market are becoming more ambitious. UK general manager Howard Lawrence stated at the PITA International Commodore Show that with COM's policy of self-sufficient manufacturing and aggressive pricing, Commodore could become "IBM's major PC-compatible rival."

The IBMPC compatible machine runs on a 68 for 4000 chip, with 256K expansion to 512K. Storage is on dual 5MB disks, and RS232C and Centronics outputs are provided. There's a 9-inch monitor with a range of display format options.

Users will be glad to know that the Microsoft Flight Simulator works flawlessly. Commodore's John Collins commented that the PC is "Marvellously different to the Japanese computer" — on which it is based — "in both features and design."

The PC is intended for launch in early 1985. The "24800 'Zin Machine'" is in an earlier stage of development. The main chip is a 68000-compatible 4010, with 256K user RAM and 128K for system handling.

Memory can be expanded to 512K. The Zin Machine features full 16-bit addressability, with dual integrated 3.3 Million disk drives and 40-bit hard disk controller.

COMAL coming

NEW software from COM software associated at the Show included COMAL, PILOT and LOGO language programs and an Assembler.

COMAL, available in August for the 64, is a structural language similar to Pascal. PILOT and LOGO are to be sold as two separate packages.

The Assembler package will enable you to program in assembly language directly onto the 64.

New CBM micros debut at Show



Commodore Plus/4 — new basic, new style, desk or laptop

COMMODORE'S two new basic micros, the Plus/4 (formerly the 164) and the Commodore 16, made their UK debut at the PITA International Commodore Show in London on 7th Feb of 1985.

Both machines operate on a new distinct basic, version 3.5, which means that CIB software can be run on the Plus/4, the 16 and Commodore 64 programs will not be compatible.

The Commodore 16 comes in a Vic style, metallic grey case. Designed for the first-time user, it has 75 programming commands including full graphics plotting and program listing. There are four cursor keys and a "help" key, which highlights programming errors.

The C16 has two stretch ports and 124 columns (33 columns at 4 languages levels, plus block). The display is 40 columns by 20 lines. There are two sound generators, a cartridge port, and a new type of cassette and port to connect the matching C1501 cassette deck.

The C16 offers 12K user RAM with 128 B004, and will be sold in the form of a starter pack with the computer, cassette deck, introduction to basic part 1, and "Tutorial" notes for C1600.

The Commodore Plus/4

"fits between the C1600 and the V164 in terms of facilities. At the moment there are no definite plans for the future of the V164."

The Plus/4's major selling point is its two built-in software packages, which are stored in ROM and accessed through the function keys. There's a word processor, spreadsheet, database and business graphics package — the most range as you'll find on Sinclair's QL, which costs £200.

The four packages use chess and exchange information through the Plus/4's screen windowing facility, which allows two packages to work simultaneously on the screen.

Further enhancements include a new style case similar to the forthcoming Japanese HX machines, with four cursor keys arranged in a diamond

shape, an escape key and a reset button.

The Plus/4 is compatible with the 1541 disk drive but is being marketed as a "package" with the SP5401 fast disk drive and the MP5403 dot matrix or DP5401 daisy-wheel printer as an added small business system.

The Plus/4 will cost £265, and like the C16 should be available in September.

New peripherals include the MP3403 seven-colour dot matrix printer, at £295, the MP3503 60 cps dot matrix dot clock, and the DP5401 daisy-wheel at £299. All are compatible with the Vic 20 and 64 as well as the new micros.

The 1541 disk drive will replace the 1541 at the same price, £125, and the new cassette deck, the C1501, for the C16 and Plus/4 only, will cost £45.95.



The Commodore 16 — for the first time ever

Thorn-EMI to show TOTL 64 commitment

Haig call-up

THORN-EMI Computer Software Development will be attempting to grab a large slice of the Commodore software market over the next few months.

Thorn's plans are based on the Crusade Sports total, a range of educational games from the USA's Horwax, and the TOTL programme for which Thorn-EMI are now the UK's sole distributors. The Horwax programme includes arcade games such as Ghost Master, Pool Challenge, The Fox and Hunter's Footstap for the 64, and Horwax's Chess and Skatman for the Vic.

Educational titles include Kato in Kato, Funminder, Story Machine and Alphabet



See More titles are printed throughout the magazine and

Thorn has titles scheduled throughout 1983.

At the firm's press launch, Thorn-EMI's Henry Knodes emphasised the importance of a solid dealer network, reasonable profit margins and good technical support, all of which the company hopes to supply.

The TOTL utility programme includes information, a Chess database for £40.95 on disk, Speller, a spelling checker for £24.95 on disk, Taxi and Label, which together form a complete mail/shelling system for £44.95 and £26.95 on disk.

For the Vic + ME, there's the TOTL Label 3.1, a mail/shelling programme for £19.95 on cassette.

Soft toys

MANY major software houses had new products in the Show

Marshall's Cascar the Cat was accompanied by a tall top version of this very kind, which is being sold at £4.50. An astronomy programme and games featuring the Mr Nix characters are in the pipeline.

The Colosseum space design utility was also on show, demonstrated by the designer

Smart Backup of Bright Green Software.

Adrian's Guardian is a faithful version of the Williams arcade classic Defender, complete with London, Hammers, Bambi, Bombers and Pods. Also on show were Eagle Empire, a Phoenix derivative, Son of Blagger, Panic Planet and Loco. Each game costs £7.95 on cassette.

Bubble Run presented the Question on disk, which combines the Wood Wizard, Label Printer, Poster Printer and Advertiser programs for

£24.95. Also on show were pre-release forms of a sophisticated war game, Snake Force, and a handwriting-teaching program for deaf children, Snapsys.

Kalder's long-awaited Death Star made its debut on a game video screen. The Star Wars version features sophisticated 3D effects.

Also appearing was Snake 1, an arcade-type escape game in which you play a pond at a POW camp.

Angry's House of Usher and Ice Monster proved popular, if the healthy 10,000 held of an unexpected joyride in any manner, and the G.A.S. 84, a graphics/animation/sound video package at £14.95 on cassette or disk was previewed.

Finally the Paradox Group showed MacCade, a range of American board software products on disk which enable you to synchronise, arrange and print out about six years old.

The disks, which cost between £15 and £25, may be accompanied by a range of extra keyboards when they are distributed in the country. For further details contact Design Jerns, MacCade UK, the Paradox Group, The Micro-position, Bedford Road, London.

COMMODORE's American boardroom managers became more and more Systems. The latest direct deal appointment is former US Secretary of State Alexander Haig.

Haig, not known noted for his knowledge of the computer industry, is the latest in a line of appointments made after two groups of executives resigned, prompted by the departure of Commodore President Jack Tramiel at January.

Tramiel, meanwhile, is reported to be planning to set up his own rival to Commodore, having sold "all or most" of his 2 million shares in the company.

Now seeking \$100m in finance to add to the \$50m he plans to invest himself, Tramiel's new company will apparently include his late Leonard and Sam Tramiel, but it has CMI chairman Irving Gould's opposition to Tramiel's chief becoming involved with Commodore sparked Jack Tramiel's resignation.

Whatever the truth behind the boardroom battles, it will be ironic if Jack Tramiel's new company, which may be producing a rival to the Apple Macintosh and IBM PC, comes into conflict with Commodore staff when the Commodore IBM PC-compatible machine hits the market in 1983.



Haig - the 100 million



Owner - Commodore (software)

CES — pointing to tomorrow

Chris Jenkins reports on software trends at America's Consumer Electronics Show, where the giants of the hardware and software market display their state-of-the-art wares

CHICAGO'S Consumer Electronics Show is a massive event, which acts as a showcase for the software and hardware products which will be hitting the market in the next few months.

Our man in Chicago was most impressed by the great strides which are being made in games technology. The industry seems to be going over towards extensive adventure games rather than arcade shoot-'em ups, so we can expect the UK market to follow suit in due course.

Notable programs included *Summer Games*, from Epyx, an 8-event Olympic simulation for the 64. Billed as "the Games that the Russians DID score", *Summer Games* is one of several athletic programs — *HNS* and *Access* have similar games.

Also notable was CRI's *Discase* Disk, an "educational" program with impressive graphics illustrating the



Summer Games is carrying the Olympic torch



Discase Disk — dinosaurs, for!

Fast data access from Wafadrive

PROGRAMMERS needing fast data access for the 64 will soon have a choice of high-speed storage systems. CRI's SPS 64 is on the way, and hardware distributor Rutanex, best known for the DMC 161 Commodore-compatible tape deck, promises a new type of fast access storage system for the Vc and 64 line this Summer. The *Wafadrive*, initially available for the Sinclair Spectrum at £129.95, features two fast tape drives, each with a storage capacity of 128K. The storage cartridges which are a special form of macro-cassette, will come in three sizes, 128K (SL18), 544K (SL19), and 1.13MB (SL20) £129.95.

Reference is given to Graham Wood claims that a high level of electro-mechanical reliability and data

security is designed into the *Wafadrive*, which has SCSI and Commodore outputs. A word processing package written by Horace Cas-

skins should be included in the system, which will cost about £160.

Several applications and documentation programs will also be available at the launch, planned for October.

For information, contact Graham Wood Rutanex, Ltd 0494-03377.

Soft switch to 64

THREE software houses are going increased emphasis to their 64 computers.

Multimedia House's plans, discussed by Paula Bryant at the Commodore Show, recognise the fact that "the 64 is now a very important machine". Post-launching Multimedia House software includes versions of *Magyk* and *Procurator*, and new titles including a graphic adventure called *Castle of Terror*, *Shardell's Mission*, an educational

retail game called *Animal Attack* and a book on Commodore 64 Machine Code for the *Atmosphere* magazine.

Salamanca, best known for a range of *Dragon* software, is now going over headily to the Commodore 64.

Development

Using a development system which runs *Dragon* machine code into C64 machine code, Salamanca plans to bring out *Wizard War*, *717 Flight*

History of dinosaurs, *Tree destruction* and *evolution*.

First Star's *App vs. App* is based on the popular *Miss Marmalade's* long-running cartoon strip. You have to negotiate a building with twenty rooms, searching for food and secret documents while plotting tricks to eliminate the opposition. Again the program features impressive graphics.

Adventure International's *Rescue the Hulk* game is one which is already available in this country. The C64 version costs £29.95 on tape or £19.95 on disk, and is the first in a series featuring Marvel Comics super heroes.

Although American software prices don't seem to be dropping, the quality of programming is improving all the time, and as reported in *Wij's Hardware*, a number of companies are planning to make UK software more directly available in this country.

Salamanca, an open adventure called *Castle Baron*, and a number of other programs by September. Salamanca's Lucy Parker commented: "We're showing prototypes to a number of chain stores to get their reactions, and we'll be converting a lot of software to run on the 64 in the next few months."

Furthermore, B&B systems of 17 Denbigh Hill Lane, London NW3, Tel 01-861 2011, will be converting a number of small business packages written for the Lynx computers to the 64.

Titles include *Multix*, an address management system for £19.95 on disk or £14.95 on tape, *Plan Blue*, a database of the same price, and *Survey*, maps and measuring programs.

Software support manager Mr. Hall promises a high level of technical support and a hot-line inquiry service for B&B customers.

CYBERTRON MISSION

Fort Cybertron, the most well-protected stronghold in the galaxy. Obsolete the Spicers, Gears and Cyberdrinks as you explore the 84 room complex in search of the For's cubes. Avoid touching the walls with their stalling high voltage charge and watch out for the relentless spark who glides through walls in hot pursuit.

E.E.P.S. (in action) and A.C. (in action) version E7.811

Commodore
[AMIGA AND LEARNING TIME]
electron B.B.C. MICRO

MICRO
POWER

COMMODORE MICRO POWER
MAGNETIC DISK 1.25 MB (1.25 MB)
MAGNETIC DISK 1.25 MB (1.25 MB)
MAGNETIC DISK 1.25 MB (1.25 MB)
MAGNETIC DISK 1.25 MB (1.25 MB)
MAGNETIC DISK 1.25 MB (1.25 MB)
MAGNETIC DISK 1.25 MB (1.25 MB)



COMMODORE 64 VERSION

SWOOP, SHOWN AND FELLS
IN THE FACTORY ARE
ALSO IN THE SHOP,
AND THEY'RE
AVAILABLE
NOW!



64 Valhalla faster, better

THE LONG-AWAITED Commodore 64 version of the legendary adventure Valhalla is now available, after long delays to the second release date.

Legend's marketing manager, Peter Moxham, commented: "Although the game costs the same as the Spectrum version, £14.95, we've made considerable improvements to the graphics — the characters are now in colour — and some of the sound effects. We're also featuring on the pack a 64Kx Game of the Year disk, an award of which we've very proud."

Peter also pointed out that the game does faster than the Spectrum original, so even those who just want to watch the game playing itself will get more out of it.



Valhalla — who said what?

Crawling, talking hardware

THE CBM SHOW saw the promise of a wide range of new 64 peripherals.

Ram Electronics, meanwhile, is working on a 256/512K RAM pack for the 64. Priced at either £4 or 14K blocks, a maximum of 64 blocks, the pack should be available in September at around £100.

A Ram Electronics spokesman commented that it was too early yet to say whether software would be available to exploit the RAM pack. Contact Ram Electronics, 106

Fleet Road, Fleet, Hampshire, tel. 02514-3834, for more details.

At the Commodore show Ram was demonstrating the Spectrum speech synthesiser for the 64, developed by ACB Micro Systems. The unit, mentioned in July's News section, costs £14.95 and features both preset and alphabetic vocabulary. It faces competition from the Adman speech synthesiser, which has been reduced in price from £49.95 to £29.95.

Quinn Software has

developed an Adman-compatible version of the wordsmith game Track and Field, which was presented at the show. Contact Adman Electronics through Mike Shorrock, tel. 0423-640912 or at Epsom Way, Harrogate, 0423-61641.

For the musically inclined, Mike Kaynes Music Computers, 17 Bridge Street, Loughborough, Leics LE11 3BA (0533 576623) demonstrated at the show a range of 64 interfaces for MIDI-equipped synthesizers. The Jiffyhouse interface is a basic version costing £29.95, and for the more advanced Red one you'll pay £49.95.

MECMAC is also distributing software which displays programming parameters for Yamaha's PM4 synthesizers, and an impressive demo version runs a D67 and Red Opus 4 with Episodes was a popular feature of the show.

Valerie's Turtle was up and crawling too, running off CBM's LOGO program. The turtle should be in the shops in September at around £20, though there'll be reductions for schools.

Have today,
yours
tomorrow

THE GOLDEN HARE of Harrogate, part of the treasure-hunt puzzle based on artist Sir William's famous book, is now up for grabs for Commodore users.

A new company, Harroart, of PO Box 165, London SW9 2JD, has bought the puzzle from the writer of the Harrogate computer book, and is now offering it as the prize in a software puzzle.

Harroart's Jeff Powell said that the first part of the game, which will run on the 64 and Vega 16K, will be released on June 1st. Harroart's Pyralide will send £2.95, as will the second part, Harroart's Pyralide, which will be released 12 weeks later.

To overcome the problems of piracy the games include software security measures and unique registration cards.

Although the price, the Harroart, is reduced to £29.95, Harroart will offer £30,000 as an alternative to the physical prize.

Rather than dipping up the countryside, all you'll have to do is pinpoint the location which is the solution to the puzzle.

Due to the nature of the puzzle Harroart won't be making copies of the game available for magazine reviews, but players are invited to write in if they have any advice to offer or questions to ask.



John Marshall's hare?



Don Wilson's turtle go faster

MEMORABLE

THE UNIVERSITY OF CHICAGO
 530 EAST 58TH STREET
 CHICAGO, ILL. 60637
 TEL: 773-936-5000

Race along the conveyor belt keeping the packages, and shin up the ladders to the shoplifter. Pickfork the Gnomes off the walkways, use the poison pouch to trip the Giant Rat, and retrieve the oilcan to keep the generator topped up.












Abstract

I THINK
YOU'LL FIND
SWOOP, GHOULS AND
CYBERTRON MISSION
ARE WINNERS
AS WELL!

**MICRO
POWER**

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 08-17-2010 BY 60322 UCBAW/PJL

[illegible]

Now your Commodore 64 is a
 robot  or a synth .
 It's processing words ,
 painting pictures  & doing
 maths  in machine code .
 It's teaching you ,
 taking you on an adventure
 & using its brains  ...All
 because you've read a book.



Sunshine books make your Commodore mean more.

Start building your library today:

Use this order form today the best books available by your Commodore 64!
 Please send me the books indicated on this form.

☐ enclose cheque/postal order for £..... payable to Sunshine Books.

☐ Please charge my Access Card/IC

Name.....

Address.....

☐ Please send me your Sunshine Microcomputer Books catalogue.

Send this order form with your cheque in postal order to: Sunshine Books

12102 Little Newport Street, London W10 6LQ, UK

Please order and call 01-437 4345 and charge to your AccessCard/IC

CompuLink orders. Ring our dealers enquiry line on 01-437 4345

☐ **Just Starting up Commodore 64** £4.95

A step by step guide to the basics.

☐ **Commodore 64 Basic** £4.95

A step by step guide to the basics.

☐ **How to make the Commodore 64** £4.95

A step by step guide to the basics.

☐ **Commodore 64 Assembly** £4.95

A step by step guide to the basics.

☐ **Assembly** £4.95

A step by step guide to the basics.

☐ **Basic and Assembly** £4.95

A step by step guide to the basics.

☐ **Advanced Programming** £4.95

A step by step guide to the basics.

☐ **Advanced** £4.95

A step by step guide to the basics.

☐ **Programming & the Commodore 64** £4.95

A step by step guide to the basics.

☐ **First Year Programming** £4.95

A step by step guide to the basics.

☐ **Second Year Programming** £4.95

A step by step guide to the basics.

☐ **Third Year Programming** £4.95

A step by step guide to the basics.

☐ **Fourth Year Programming** £4.95

A step by step guide to the basics.

☐ **Fifth Year Programming** £4.95

A step by step guide to the basics.

☐ **Sixth Year Programming** £4.95

A step by step guide to the basics.

☐ **Seventh Year Programming** £4.95

A step by step guide to the basics.

Splat attack

Pete Gerrard sinks to submarine depths to review new games

WAVE JOYSTICK will travel, as the old saying goes, and this might seem to be marooned in a variety of interesting locations from underwater to outer space. From the wild west to a haunted house.

Our underwater escapade begins in a game called **Submarine Commander**, produced by the Creative Sports branch of Team EMU, for a Vix 20 with 18K expansion. Now, regular readers will be well aware of the fact that I don't often overstate about games for the Vic. Indeed, my opinion about some of them must surely be the additional censorship pass. However, **Submarine Commander** is one of the better games available, and it was extremely difficult to stop playing it and start writing this review.

Stunning

You are put in the role of commander of a Mediterranean-based submarine, and as true Vikings in the Bottom of the Sea approach job is to rid the sea of as much enemy shipping as possible. There are three basic screen displays to help you in doing this, and the one that you'll probably be using most features a stunning high resolution drawing of the Mediterranean area, complete with a flashing dot representing your submarine, and several non-flashing ones representing the enemy which move around all over the place.

You have to chase after them and when willing target switch to another display, which this time shows what is to be seen on the target screen. When you've detected your opponent at the enemy you must come up to the surface and switch to the third display, which now shows you a portable eye view of whatever happens to be sailing on the sea.

Having got the enemy in your sights, a very good use of the space bar sends a torpedo hurtling homing in for the kill. These torpedoes are not passive however, and there is a warning chance of you coming in for some bombardment as well, in which case your only chance is to dash across to the winds and descend to the seabed, trying to avoid descending mine. And yes, it is possible to crash if you attempt to take over submarine onto dry land.

A wonderful game, with a lot of things to think of at once, not least of which is remembering which key to press to do what in your efforts at locating a torpedo which is your submarine blowing its hullian tanks and rapidly ascending to the surface. A highly recommended game.

One of the more ridiculous games to come out way this month is **Bob's Blunder** from Palomex, working on the unexpanded Vix 20. In this game you take on the role of

Bob, an electronics shop owner/worker and underpaid, a complaint that would be echoed by most of us.

Your role in life is to every hour, and, like some baddies I could name, you haven't done a particularly good job on the last one that you visited, due to it says best to the lack of financial motivation. As a result of that your overpaid and underworked boss has sent you back to the house to get the job done properly, although this game presents you with a rather convoluted version of the above scenario since the only thing you have to do is stand a face.

This is even easier than it is in real life, since Bob's Blunder apparently believes that you can model a face merely by bumping into it. The face is situated in the centre of the house ground screen. The house wouldn't be any architectural genius, since it only consists of one corner cut out walls and one corner cut out a doorway, beyond which is the face. It's got to be the face you see up against both a red flame and what the screen only said dramatically refers to as shadows, planted there by your wicked boss.

Dull

In the right hands this could have been turned into an interesting game, but whoever programmed it has apparently got the wrong hands for him, rather, since the game falls down on a couple of points. One, it is extremely dull, with not too much going on, and secondly the game feels that you're given to reach the face is ridiculously short. Even if the screen were devoid of walls and shadows it's doubtful whether you'd be able to get to it in time. None of the game players or other Gerrard managed it, and in the words of the manual book, I'll give a one out of ten.

Defender, but in defence of the company who've produced this version for the last expanded Vix (Amiga Software), they at least have the good grace to call it Bob's Blunder, and have the word face in extremely small print and Defender in extremely large print on the cassette only card.

Classic

You are, inevitably, a hero of galactic proportions, who has been chosen to save Earth from the damned alien who've come here to do whatever damned thing do in this case, they are attempting to abduct various members of the human race who have been stupid enough to stand at the bottom of the screen, while in the same time changing after your space ship and trying to shoot you down. Yes, of course, have to rescue the humans and destroy the alien in what has become a simple classic shoot everything, and who does what. Now read on.

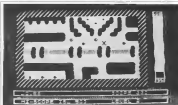
One thing which prevented Defender from following in the footsteps of Space Invaders and Asteroids and becoming a truly revered game was that you needed more fingers to play the game than nature provided you with. Fingers landed around later was Spaghettis trying to find the right button to press in the right time. Amiga have remained pretty faithful to the original game, although they have at least brought the number of necessary keys down to eight. This is, of course, still far too many.

There are various different types of alien, some more deadly than others, but only one can shoot humans if this particular alien should manage to get a human to the top of the screen, the human turns into a monster, which is the possibly most deadly enemy of all. Some of them follow you about, and require very deft movements to shoot them down. Either that, or a quick trip into hyperspace to reappear somewhere else on the screen. With a radar to show you what's happening off screen, this is probably as close as you're going to get to having a proper version of Defender for the Vic.

You may need to shoot a friend to come and help you play it, but life becomes a bit



Charles Perry — best of EMU for the Vix 200



Spies — danger of strawberry jam

more tolerable when a spywar. Only four boys in every three (five, I'd say, for anyone with fingers as delicate as Paul Simon's) keep your eyes open for a copy of this.

Random Software have been clearing out software for the unexpanded Vic for sometimes now, and *Spies* is one of their latest efforts to convince people that all the publicity blarney is true.

Well, it isn't. This is a copy of *Spies* invaders, although there are some differences across to appease rather than the one. Using either keyboard or joystick you have to go through the usual *Spies* level-type stages, and then on the second screen avoid the alien and their fire as they bob and weave about all over the place.

Screen three is a test of your reactions, as automatic rain down the screen and you have to dodge out of their way. You can shoot them as well if you want, but as they come often closer down in pairs of two or three, and your ship is wider than the gap created by shooting one of them, this isn't always advisable.

Walters

I know the unexpanded Vic has a policy 100% of memory to play with, but some people (Burrus Amore, like me, mostly, I think) are in a hurry to produce some very good, original software for it, with original being the keyword. Oh well, please let your walters dance the future course of software computers.

Some Commodore 64 games now, and this month's price for the company that has produced the most reliable publicity campaign of 1984 so far goes to Random Software Ltd., for a little number called *Spies* (other exclamations mark, not mine).

Spies comes explicated with a lot of shiny after words, brochures, competition news, and anything else you can come to think of. But at the end of the day we're more concerned with the quality of the game than the quality of the packaging.

I will admit that I was prepared to harshly dislike this game. Any console only card bearing the words "The Invasion Exploration Area under attack" sounds on coming out like one. Strawberry Jam? It is not guaranteed to send me rushing for the new vic joystick and keeping into action

No when the game actually got started, it was a pleasant surprise to find that it really is quite good.

The "Mission Exploration Area" is the screen, which, in a set display of high resolution graphics, scrolls randomly left, right, up or down, taking you and everything else with it. You occasionally see called Zappies, and your little ship's role is left in to avoid being caught by the screen and the walls that surround it. You can also bump into various strange plants and collect some bonus points, while trying to avoid bumping into some of the many enemies that populate the "Mission Exploration Area".

There are seven levels in all to explore, and *Invasion* cheerfully tells you at the start of the game that you'll have "an chance" of escaping from level seven. Having never got further than level three I can't tell before it. There is no escape route as such from each level; you merely have to survive for a certain length of time, which is indicated by a sliding display at the right of the screen. Survival automatically takes you into the next level where there are twice as many enemies to be avoided.

Joystick response is very quick, perhaps too quick, but I found that playing it with the keyboard was even worse. One side track is that you can define which time limits control your movement, if you don't

like the ones. Inactive have defeated in the task.

An interesting and unusual game that stands despite everything. Who knows, this could be one of those rare moments when a game for a home computer spurs a dedicated arcade machine, rather than the other way round.

Pointed on the scientific card accompanying *Megawatts*, from Paramount Software, is an extract of a letter that they have apparently received concerning this game. It says "When I saw *Megawatts* at my local dealer showroom — I bought the computer!" Makes a change from buying the computer I suppose.

I have no reason to doubt the authenticity of that letter, but when I do doubt it is the name of the person who wrote it. *Megawatts* is certainly not a bad game, but it isn't that good. I can't imagine rushing out and buying, say, a 6400 computer if I saw this message on it.

It is described as a magical planetary trip, since the purpose of this game is to make it run from Pluto to Earth, taking off at all the planets on route. But that is no simple planetary trip, since the bonus substances of each planet are out to prevent you from completing your journey. These substances all looked remarkably similar to me, and there all seemed to behave in similar ways as well. The only thing that made the various planetary hops different was the number of stars that each set of alien had to be killed. Once to go from Pluto to Neptune, once to get from there to Uranus, and so on.

Star Wars

Controlling your spaceship is quite fun, since this is out of those games that believe that once you've started moving, you can't ever pause stop! Then you quite often find yourself bouncing randomly about the screen, bumping into walls and stars as total disregard of space traffic rules.

Periodically a few asteroids, leftovers from the latest Star Wars you've done, float about the plane, and you can collect bonus points for picking up these galaxy's trash items. But as going to pick them up sends your spaceship scurrying about like James Hunt on a bad day, this is probably not to be recommended. ▶



City Attack — urban warfare and flying saucers

•Nice idea, share about the program

Terminal Software, as has been noted before, produces titles on tape, and if their latest effort, *Triple Tournament* is anything to go by, they're going back towards the game again. Not most by any means, but not at all bad.

Triple Tournament is precisely what it says it is, a collection of three games that can be played by either two players competing against each other, or by one player doing battle with the computer. For the two player option, you'll also need two joystick units, quite reasonably, there is no keyboard option in this one.

All three games are loaded in at the same time, and whatever mode you happen to be playing in you have the choice of having one round in succession with each one, or three rounds with just one of them. Your scores are tallied up over the three rounds, and in the end of the third you the highest score automatically enters the game individually the game probably wouldn't merit an over-enthusiastic review, but presented in this way they're somewhat enjoyable flaws and together they stand as quite a decent little package.

Quickies

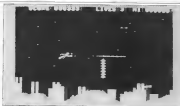
To take them in turn, *Wing World* is the old warzone favorite, the shoot-out. Just two opponents moving about on the screen, and whenever you the first reconnaissance you are the holder of 1,000 points. There's a collection of mine, turret and other debris between the players, and this must be shot through first before hostilities taking off your opponent.

Space Race is a real joystick wrecker: as you race along in rockets in space, bumping one all manner of enemy ships before attempting to dock with your base at the end of a.

Finally *Kamikaze* sees you in control of a ship at sea, under attack from a number wave of planes. You have to shoot the planes before they can get you in any way back.

An excellent idea from Terminal Software, and with it different speeds at play, the package is pretty good value for money. Let's hope that there's more of the same on the way.

Every dog has its day, and every game of



Wing World: Opponent comes on the stage

program seems to have its month. Recently flight simulation programs have been appearing with the regularity of new computers, and one such for the Commodore 64 is called, simply, *Flight Simulator*, and is produced by Amiga Productions.

The basic premise behind every flight simulator of the name you have to take off, fly for a predetermined amount of time for to a specific destination and then land again. With Amiga's program we have a choice of a number of airports to fly to, with take-off always taking place at Heathrow airport.

Controls are rudimentary, and the keyboard is extremely sluggish to respond, but then I don't suppose you'd expect a Boeing 747 to turn through 90 degrees in the length of time it takes to press a key. But the sluggishness is still annoying, as you are constantly left wondering if bewildering wondering whether you've pressed the key or not.

Screen display is generally not very good, although you are presented with a nice high resolution map of the UK to show you where all the airports are. With that warning caveat presented by all reviewers, I managed to fly to Luton airport from Heathrow via somewhere near Dover: the arrival at Luton, the plane went into reverse control, and ended

disastrously in a crash landing with my being able to do nothing about it.

Subsequent attempts failed no better. A good flight simulator should make you feel that you're actually in the plane, but with this one I was never in any doubt that I was firmly entrenched in front of a 64, looking on the test machine's monitor as the radio

Packages

Software for the 64 is appearing at a fast old rate now, and some of the better programs to watch out for include *Kills*. Well, from Alligap. This involves monitoring identity a set of high resolution targets and enemies, shooting high bullets, fish and birds as you go. Getting through to the next level of difficulty is not easy, in a single minute transports you back to the start again, but this is well worth the long loading time.

Black Hawk from Creative Sparks (Thorn 1245) is another one worth investigating. In this you're on a raid across enemy territory in the great plane Black Hawk. Some superb graphics as you attempt to use off the enemy, and a nice mixture of attacking and defensive missions is required before you'll get anywhere playing this.

K.Tel, whose name branches were about as exciting as some of their records, have bounced back with something called *Cyberdial*, which owes a little to *Penelope* and a little to *Space Invaders*. The end result is quite interesting, but it does't mention interest for long at the General portable arcade.

Finally, Advanced Computer Enterprises appear to be heading early by the names, with *Miniball*, *Arctura*, *Single Comet* and *Missile Control* coming together in one bundle. Only *Missile Control* proved to be of any lasting appeal, and even that didn't last too long. But you may be attracted by ACE's low price — £1.99 per program.

Commodore games of 1984 or so? Well, for the Ye you'll have to go a long way to find *Quartet* from Micro-Arena, and the 44 game of the year has really got to be the International House carrying from Commodore Designers? I thought you might.



Triple Tournament — all have (left) input

"I'll swap four of my tapes for your Activision."



You know the feeling. A couple of plays and the best you can hope for from so much of the software around is swapping it for something better.

Well, the something better has arrived: Activision.

One thing you can be sure of: Buy any Activision software and you'll find you're walking sleep, being into a totally new experience. One that lasts.

See the first titles in your usual Commodore software store now.

BEAMRIDER · DECATHLON · H.E.R.O. · PITFALL · TOY BIZARRE · ZENJI



ACTIVISION.
Computers were made for us.

Money juggling — enter the spreadsheet

Do you want to play the stock market, run a business or simply keep track of your bank account? Mike Green explains how spreadsheets can alter your life

ELECTRONIC spreadsheets — somehow even the word fills the air with a certain style, a feeling of slight electronic tension. Images of money, treasures in suits grouped around graphs and tables, forecasting and forecasts, money, money, money, money, making their first millions. No money who we say or what we do — we have to admit to a certain fascination with the whistles and bells of the stock market, the gamblers in casinos and pits, the people who make and lose a fortune at the twitch of a telephone and a snap command to tell now. Unrelated stuff maybe — but romantic all the same.

But now, the world of the cash flow analysis, forecasting the financial future, profit and loss and other necessary areas has come into the home with the advent of the electronic spreadsheet for the home owner. After taking the business world by storm (VisiCalc and Lotus123), the software manufacturers decided that the rest of us might also be attracted to this form of computer use — managing our money. The result has been a host of VisiCalc wannabes joined with the word "calc" in the title for the home computer.

But what exactly does the phrase "electronic spreadsheet" mean? Or perhaps of more importance — what does the software do?

The easiest way to describe a spreadsheet is to imagine a single sheet of paper with a few columns and rows, each labelled with a name.

The matrix of the paper is that you can enter data into the appropriate cells in the boxes and then add them for whatever you want. So really it's like having a simple method of looking at your figures or you can understand what's going on. Think of another example of a spreadsheet, a bank statement. Again all you have is a piece of paper with figures, names being added and some being subtracted so you end up with the final total. Although the bank statement doesn't actually contain the boxes, they are still there if you think about it.

Budget restriction

If you are interested in budgeting or paper that every time you ask a "what if?" question you have to change all the figures and remark all the arithmetic — which is a bother and takes time. But suppose you

enter the information for your budget into a spreadsheet on your computer — then you have the ability to ask "what if?" and the computer will work out all the sums for you. Then it's quick, easy and very valuable, so "what if the mortgage drops by 10%?" can be answered for a month or a year in about 1 second.

There are many other uses for spreadsheets, like checking your bank statements, entering your accounts, calculating stock owned, budgeting for a wedding, and so on. The principles remain the same throughout. You enter all the figures and set up the structure of the spreadsheet once — and then forecast more

in a great time span, as everyone I know thinks of ways of improving their spreadsheet afterwards, and it's a great help to be able to move columns around instead of starting again.

Another small thing (but so useful in practice) is the ability to "fix" the cells. As you move around your spreadsheet, obviously the cells will scroll off the page (so imagine you go down to the right). Once the cells have gone it can be annoying trying to ensure you put the figures into the right column (you may have to scroll back and check, then scroll to the right again). By "fixing" the cells though they will stay along the top and left of the screen, and only the figures will scroll.

Columns width is variable too; you can have any number of figures in each column which is important for larger figures. Quarterly accounts or for much smaller figures where it's handy to get more than one screen to look for the examples.

Other features that Practical Plus boasts are graphics capability and sorts and searches (you can look for all figures more than all for example). It is quite an extensive package for the price, and surprisingly enough the screen limit of 32 and 31 columns and rows is not as much of a problem as I thought it would be.

In view of the cost I feel this particular spreadsheet to be excellent value for money. It is available on both tape and disk from Computer Software Associates.

As far as I know **Plan Manager** is the only spreadsheet at present designed to work on 80-column, for either the VisiCalc or Commodore 64 (with an 80-column card). The great advantage of working on 80 columns is that you can not reach more of the page or not go to the screen's limit as I having to scroll around a lot. The next annoying fact is that the software comes from Com. Int'l if you buy the 80-column card from Impact Design Ltd, and you might well consider buying it if you are considering serious work (perhaps). The only real fact is that Plan Manager costs a couple of very handy figures.

Looking at the good points first, Plan Manager comes on disk or tape and has the great advantage of 80 columns. The manual is easy to read, you can have changed columns width and justification (left, general, right and centre) can be positioned to the left and numbers to the right, you can "print"



you just alter the figures in appropriate and your computer does all the hard work for you.

Practical Plus is the only spreadsheet I've reviewed for the Mac 30, and considering the price of £19.95 is quite amazing. There are no impressive array of properties, and I'll spend a few minutes explaining these as they make the difference between an easy-to-use spreadsheet and software that can frustrate you.

First **Practical Plus** has a "calculator" function — which means you can copy the contents of one box for use as they're called in another box or vice versa.

Another very important function is the "insert and delete" one, enabling you to add a column or row (or column & a row) you've set up your spreadsheet. Again this

any call instead of having to scroll around the sheet and you can print out the contents of an individual screen (a screenshot facility) which is very useful. Another very useful feature is the ability to turn the automatic calculations off so you don't have to wait after entering a new number whilst the computer automatically recalculates all the formulas before allowing you to move to the next cell.

What I found lacking was the ability to "repaint", i.e. to enter every figure in every cell and the fact that after entering a number in a cell and pressing RETURN to get the data into the program, I then had to move the cursor (usually to the right or down before entering the next number). This may seem a little thing, but having been used to spreadsheet which gave you the option to load a very interesting feature it again. But as the editors in this — a series of little "glossy" to complain.

Basicalc have produced a range of spreadsheets, and the one I had for review was Basicalc 2 for the 64 bit 68K + VAX for text and C11 + VAX for data. I found the program extremely flexible (unlike the others you aren't tied to a specific shape but can use the memory of 256K cells in any



shape you like. This you could have an extremely long list of some only 1 column wide that a lot of stock copy on the more traditional shape with 12 columns or more.

All the traditional features are there, with options: variable column width, goto anywhere (called "jump" in Basicalc jargon) etc. As I mentioned before, you can also control the cursor to automatically move up, down, left or right after you have entered the data, so it's ready for your next entry — a great advance on spreading up and limiting the number of keystrokes.

Basicalc 2 has several "help" features which allow you to enter and drive rows or columns, decide if you want all your figures as integers (whole numbers) or rounded to 2 decimal places (which you would for financial sheets), a "find" facility to allow you to search for a word or formula, etc. A very attractive feature is the ability to change the colors of your sheet to suit you, and if you "find" the color then the color of any part of the sheet that is found is also changed (helping you remember that you're "find" that area). I saw this color feature a lot, using different colors to distinguish between different sheets that helped could be very, bank statements, etc., my personal accounts, etc.

What all the software will allow you to print out your sheet, Basicalc 2 was the only one of the four under review that would allow me to print out on my ST/A8 printer as well as on the faithful Commodore 128 (in my case the 128S

BUSICALC

80) without any hassle. If you have a 128 then this printer automatically "hangs" after the instructions to print, but Basicalc carries for that and all you do is enter a shift "C" instead of the unshifted "c" which is all you need usually.

There are plenty of other facilities, but in the space provided I cannot list them all. I find that it is an excellent program, from the best, but also it's not the most expensive and it is particularly easy for the beginner. There is no command scope in the mathematical editing (for too complex for me) but it is major advantages for that it is easy to use, very flexible, and simple to understand. The formulas are not understood automatically (very useful in saving time) and are worked out in order like 2+4*5=12 not 18. This type of mathematics is essential for spreadsheets and there were many requests to have to get used to.

In practice I couldn't really find any faults for the average user. There is no capture ability, the manual I had was well written but poorly presented, and it has the irritating habit of asking when you press spreadsheet it before you load it off disk (which I can never remember), but really this is no-picking.

One additional feature, which is invaluable if you like a professional appearance in your final printed, is the ability to print your sheet in many bases as you like, so you can go with columns and rows going a very neat appearance. Although this package is more expensive the ease of use makes it worth the extra cost the screen size, which provides a good introduction for the beginner.

Rolls-Royce

Multiplan must be the "Rolls Royce" of spreadsheets for the 64, available from Kaba Software at a cost of £99.99 (usually quite outstanding). Originally written for larger computers the manual still refers to the Apple, and all the diagrams in the manual are for 40 columns instead of the 64 columns of the 64 Multiplan (which is good). Firstly, the presentation has all pages which contain a superbly bound volume like the desktop is a treat for the manual, which I found looked better in the diagram than in real life as a kept copying over when I used it. But the manual is comprehensive and well presented, with slightly glossy paper neatly printed.

The manual contains a comprehensive drawing section and a well written glossary describing every command and feature. Only the version on adapting a printer (for example an Epson or similar type) was inadequate and very clumsy, and I never really learn how to print out on my Star without the 128 (again maintaining the diagram sheet 12) — because of the difference in the ASCII codes — although I am sure it can be

done. But learning to use Multiplan is a delight with the manual on training.

In use the program begins showing the data, a procedure I found created to show me up quite a bit. The use of colors is consistent which is a shame that the original flexibility of the program is the main advantage, as it seems to do just about everything.

It has all the features I've mentioned so far in this article (of course) but some are even better. For example the column width is adjustable, but unlike previous programs which you have to alter all columns to the same size width, in Multiplan you can alter individual columns to different widths. Similarly it's possible to specify that you want 2, 1, 4 and 7 or 2 decimal places, while columns 4 and 5 are set to integer. All this is due to the fact that each cell, column or row has separate options for justification, width, format, etc. and this can be control left or right justified. You can even have the C entered in any column or row.

There is a very comprehensive menu including blank for saving the data in a cell or group of cells, copy, delete, edit, format, help etc. This last command will enable you to call up a comprehensive help screen from within the program if you're confused the moment. You can also cut, search, move rows or columns. In fact, look formulas if you want to have calculations off, create or delete windows and even put a border around your window.

If you want to view or load you can display the directory and then place the cursor over the file and press RETURN for automatic loading (very nice touch). Most features can be accessed several ways but other words you can place the cursor over the command HELP and press RETURN or you can just type "H" to obtain the HELP screen and I found the flexibility a huge advantage in fact as I had to



Commodore 64

Small Business or Home use

Desktop

Price from £195

How to manage your time as well as your data.

Go for TOTAL integration

Not only do you get a simple-to-operate high productivity program for your data management, you also get the full potential of the TOTAL range of compatible programs, allowing you to expand your computer use interactively.

Program with TOTAL Infomaster

This sophisticated but clear data management system gives you control over large volumes, complex information. Features include: maximum of 10 files per disk; 2,000 characters per record; 100 fields per record; 245 characters per field; disk space for only 100 records; variable record field definitions; unique key for fast access; records displayed in turn or by field-search selection; optional reporting capability - including design, sort-order, subtotals, selection criteria, reports generated in daisy format.

For Small Business & Home

DATABASE MANAGEMENT

for the Commodore 64

with 1 or 2 disk drives

and

Commodore 6400

single or dual floppy disk drives, optional

TOTAL INFOMASTER 4.0

Call Product Line (0252) 518364

Use our specialist advice and for queries on program use. This service is free to both users and stockists.

Your copy of this program

TOTAL Infomaster (Cat. no. T006) 42 is available from all good business computer software stockists. Recommended retail price £49.95 including VAT. Send me (tick as required)

The address of my nearest stockist

A full specification for this programme

Your full list of business products

Please allow 25 days for response

To: ThornEMI Computer Software Distributors
295 Farnborough Rd, Farnborough, Hants, GU14 7HF

Name

Address



ThornEMI
Computer
Software
Distributors

ADQ2

COMPUTER SOFTWARE DISTRIBUTORS FOR CREATIVE SPARKS / HESWARE / ILS / MINICOMPUT / TOL / DATAMASTER / HUMAN CODE

many others, but with 1000 I settled into a routine.

So how about my personal opinion? Well, there's no doubt Multiplan is economical and very flexible, but if you're a firm user you do need a bit of support, because it has so much that you wouldn't see that it is more a master than a servant running a small business (or even a large one for that matter) then this must be the spreadsheet for you — if you've got a 64. There's so much flexibility and so much scope that I know I'll never get full use of it, and manipulating data around is much easier than with other programs I've used. Multiplan is easy to correct deletions and moving columns and rows is easy and quick and one feature I really like is the ability to make an area of the sheet glow. As in the Budget in Figure 4 you could make the income column and NAME's

"Income") and then use that name as a formula for the total income as the final total by joining the formula TOTAL = INCOME — EXPENDITURE.

There are a few more features as well, like the built-in master (called a reference table) which contains all the commands and codes to do many tasks at a time, like the HELP screen, like the use of the % symbol of inventory as the use of a bar graph like the variety of methods of using the screen and so on. My final point is adjustment for the way that formulas are copied, which I will attempt to explain (although it's far easier to do it than write about it). If you wish to add 3 with say you would put the cursor into the TOTAL cell and then press "=" to let Multiplan know you are creating a formula. Then you just move the cursor to the appropriate cell — and as you do so the formula appears on the screen. So if you

were moving up one cell the formula would start your original cell names and now because you've moved up a row. Then you key "=" and the cursor jumps back to the cell box, and you move up 2 places then use the formula made the original cell names 2 rows.

This sounds very complex, but in fact it's much easier to enter formulas that way, although the result on the screen can look very complicated. The main bit is that you don't need to write the complicated bit, you just move the cursor and the software does the rest.

Multiplan is by far the most sophisticated system I've used, and if you need this complexity then I can highly recommend it.

Spreadsheets are derivatives for home budgeting, small businesses, help accounting, manipulating numbers for construction, gear ratios, anything where constant calculations need performing. Most software does the same thing, a few points that pricing makes it more likely to make it a success. But for the frequent user the cheaper systems are as good as any.

Trying to assess value for money is hard as it really does depend on what you want to do. I cannot really differentiate between the four I've reviewed, as all are good value for the price. If you're uncertain, I'd advise sticking to a cheaper system at first unless you know you'll be using it a lot, so which one you'd use as much as you can.

The biggest advantage to top end sheets is, as my opinion, they make doing accounts fun. And that's worth a lot if it means being overall on top money — and here, you win bigly. ■

PRAC/TECH/IC PLUS	Marketing Microcomputers	£19.95
PLAN MANAGER	Implex Design Ltd	Price (with Microplan user)
SP/ICALC 2	SuperSoft	£11.95
MULTIPLAN 64	Kotaka Micro Marketing	£99.95

Implex Design UK Limited
Moss House, Second Way, Wembley, Middlesex, England
01-800 0999

Kotaka Micro Marketing
One 8, 17, Broadfield Road, London, W13 9AF, England
01 899 4664

Marketing Micro Limited
Golfers Road, Whitehouse Industrial Estate, Ipswich, Suffolk
0473 462121
SuperSoft

Whitehouse House, Cassing Road, Wrexham, Merseyside
01 943 3134

NEW! AMAZING NEW SPEECH SYNTHESISER FOR YOUR COMMODORE 64

ALLOPHONE BASED SPEECH WITH AN UNLIMITED VOCABULARY

- New basic commands give full control over all speech functions
- Approximately 200 predefined words built-in
- Speech may be produced simultaneously with graphics and sound
- Extended Basic commands are very powerful and are well thought-out for other speech synthesizers
- This must be one of the most advanced and comprehensive speech synthesizers available today
- Rarely has anything been so easy to use as a Commodore 64.

Order now by sending cheque P O
Access number to -
J.C.B. (MICROSYSTEMS),
29 Southdown Road,
Downton, Dorset BH6 5AL
Tel: (0202) 40000.

Dealers - please contact us now
Never have our terms been better



Speakezy

All this at
an amazingly
low price of
£29.95

• Requires 16K free
Software for use with Commodore 64

J.C.B. (MICROSYSTEMS)

SUMMER MADNESS SALE FROM SCI(UK)

Order Today
 Trial Tomorrow
 We challenge you to find a better deal



EPSON PRICE SPECIALS



EPSON 8300 (DOT MATRIX)	£249.00	£199 + VAT =	£233.00
EPSON 8300PT (DOT MATRIX)	£284.00	£239 + VAT =	£253.00
EPSON F380 (DOT MATRIX)	£339.00	£334 + VAT =	£353.00
EPSON FX100 (DOT MATRIX)	£279.00	£238 + VAT =	£257.00
EPSON 83100 (DOT MATRIX)	£359.00	£308 + VAT =	£328.00
EPSON FX100 (DOT MATRIX)	£369.00	£349 + VAT =	£368.00

DAISYWHEELS

JUKI 6100



SCPS, Bidirectional & Left Feeding
 10, 12, 15 & 18 characters/spacing
 Removable Cartridge
 20 Gutter, 10 Inch Margin
 User-def. Backspace & Linefeed
 Continuous Internal Standard

THE DAISYWHEEL THAT
 HAS NO COMPETITION
 OPTIONAL RS 232
 TRACTOR AND SHEET FEEDER

.... at an incredible new LOW PRICE!
 Just **£329 + VAT = £370.00**

WE WILL MATCH ANY GENUINE PRICE ADVERTISED

SCI(UK) IS NEVER BEATEN ON PRICE

MANY MORE PRINTERS AVAILABLE - 1000's OF SOUND BARGAINS

SEND NOW FOR THE **FAMOUS SCI(UK) CATALOGUE**



for cheapest prices telephone **0730 63741** or **0730 63745**



MORE SCI(UK) BARGAINS

SHIMADZU CP80 **£179 + VAT = £202.00**



Proton and raster feed as standard
 80 x 14.5
 Bi-directional high feeding
 12 x 2 dot matrix printing from 10mm lines
 Bold and superscripts
 Bold printing and auto underlining
 Continuous, compressed, expanded and
 double strike printing from 18 mm to 1.5
 (line)
 Parallel interface fitted as standard

FIDELITY 14"

**COLOUR MONITOR
 & COMPOSITE VIDEO**

£169 + VAT = £193.00



Now from the world famous **CANON** Company

CANON 1080A RLQ DM best value ever at **£389.00 + VAT =**

We have interfaces for all types of
 computers, including C&M 64, VIC 30,

APPLE, TRS 80, IBM, BBC, SPECTRUM, QL, etc.



14 HOUR EXPRESS DELIVERY £1.50 plus V.A.T. • EXPRESS ORDERS, DELIVERY SOCIETY CREDIT, PAYAL ORDEES - SAME DAY
 ALL ORDERS GUARANTEED TO THE FULL ORDER PROTECTION SCHEME • CUSTOMER REPRESENTATIVE CONTRACTS AVAILABLE
 NATIONAL DISCOUNTS VERY WELCOME

It's **SUNDAY** - Do you realise you can order **NOW** - We are open 7 DAYS A WEEK

ORDER FORMS
 ALL DAY
 WRITE FOR DETAILS

SCI(UK)

10000 TELEPOST for 15 minutes
 24 HOURFIELD HUNTS GUDD HALL

0730 61745
0730 63741

0730 61745
 0730 63741

Postcode 10000 16 Midgate Lane Sheel **PETERSFIELD** Hants. **TELE 0430 61745**

Utilities to give your 64 freedom from Basic

Kevin Bergh discovers five software packages which supplement the 64's Basic — and help you to write machine code games, use tapes like disks, escape from POKÉs, diagnose faults and even avoid Basic altogether

IF YOU love your 64 but hate its primitive version of Basic, there are a number of ways you can remedy the situation. There are an increasing number of utilities available which enable you to make better use of the sound, graphics, disk capabilities and other features of the 64, and in this article I'll be looking at five of them — Scope, a language intended for game writers which compiles into pure machine code; A2Disk+, which helps your cassette drive to act like a disk drive; Turbo Extended Basic, which adds commands for sound, colour and graphics; 64 Doctor, a fault-finding program; and a version of the programming language Pascal.



A completely revised ISP has come up with a game design language for the 64 called Scope. The book says, "The remarkable product will revolutionise programming on the 64". Well, it certainly makes a difference. Scope was rewritten by programmer Allan Proulx from the original version designed for the Sinclair Spectrum.

The program comes on tape or disk, with an instruction manual and demo routines. The package is based on a large video case which, a lot of companies seem to be favouring recently.

Scope supports 46 commands which allow the user to write programs in a form of assembly language that is easily understood. Coding started is very simple: just LOAD "SCOPE" and away you go. The demo programs are then to be examined. There are seven, ranging from a word effect to a horse race. By the time you should be fairly impressed with Scope.

To progress further you will need to refer to the manual and become familiar with Scope and its commands. The 60 page manual is very comprehensive, and should enable you to make good use of Scope. Each command is covered behind a REXL statement, and the user must construct an area for the program to be compiled in, therefore the first command would look something like, 10 REM ORG01500, 20000 the last character on each line must be a colon.

Commands

The manual lists the commands and their uses. They are commands for handling numbers (VAR, INC & DEC), colour and graphics (GMOVE, DRAW etc), placing characters on the screen (PUT). There are a range of relational and conditional commands and a command to scroll the screen one character at a time. There are of course special commands for sprites and sound and a command for the raster.

ISP claims that writing took a 16 times faster using Scope, and that the result is 100% machine code. To put to the side the program must be compiled, using a utilities command, and that saved with a utility program supplied with the package. The result is very good and very fast, but you need to calculate the start and end addresses of the code that Scope generates very carefully.

Apart from the demo programs supplied, there are many example programs in the manual to support enthusiasts of the commands. The demo programs are also listed, along with a dictionary. ISP also intends to start a Scope user's club and a

programmer hot line, membership will be free to Scope owners.

The overall impression ISP seems to give is that having the program will help you become a "professional" overnight. That is not quite so, as Scope is a language, and so much will require total learning. Again from this, Scope does come up to expectations and you can expect good results from it.



ISP claims that a well-run full support to any Scope user who wishes to market a program written using Scope. It's possible to run a Scope-compiled program via Scope in the memory, if you know how. Considering the speed and simplicity of writing Scope programs, it would be surprising if there wasn't a market in the market room. At £79.95 on tape or £149.95 on disk, Scope is no standard buy and should give you plenty of "scope" for your money.

From Melbourne House comes another entry called ACOS+ a collection of enhanced Basic commands for the 64. Melbourne House claims that it will make your 64 commands disk as convenient as a disk drive. What is certainly makes tape usage easier and more organised, it doesn't even start to compete with the speed of a drive. ▶

The 64 Software Centre

1, Princeton Street, London WC1. Tel 01-430 9054

The specialist centre with the widest range of software for the Commodore 64 and the best service. Open 10am/6pm (incl Saturdays) Demonstration facilities

Over 300 games in stock Over 75 business applications and utilities, Flight and War simulations

Exceptional package offers from stock. Limited offer - order now to avoid disappointment

THE MASTER PACKAGE:

The most powerful software for the Commodore 64. Superb quality for those who demand the best (disk system)

Master 64 — Basic 4 editor monitor + + +

Mathplan 64 or Advanced (all result) —

Spreadsheet

Oracle 64 or Moggie or Superbase 64 —

Database

Paperclip 64 or Visawrite + Visapell — Word

processor

64 Doctor — Diagnostic disk

@ £225 incl. VAT (postage extra £10)

THE SENIOR PACKAGE:

Superior software (disk/cartridge system)

Vulture 64 — Basic 4

Ultimate 64 — Graphics system board

Practools 64 — Spreadsheet

Simplex 64 — Database

Simplewrite — Word processor

64 Doctor — Diagnostic disk

@ £220 incl. VAT (postage extra £5)

THE PRACTICAL PACKAGE:

Really good value for money. Good quality, efficient software for everyday use (disk system)

Superdisk 64 — Programmers utility

Practools 64 — Spreadsheet

Prochris 64 — Database

64 Doctor — Diagnostic disk

@ £160 incl. VAT (postage extra £3)

THE BUSINESSMAN'S PACKAGE:

The complete package of high quality software for the businessman (disk/cartridge system)

Arcom Systems Sales & Purchase/Inward

ledgers — Accounts to trial balance

Gemini Final Accounts — Trial balance to

balance sheet

Inventory 64 — Stock control

Easy Calculator — Spreadsheet

Superbase 64 — Database

Unit 64 — Statistics

@ £225 incl. VAT (postage extra £7)

THE HOUSEHOLDER'S PACKAGE:

All you need for full use of your Commodore 64 (cartridge system)

Home Office — Word processor and database

Home Accounts — Bank cash budget

Referrals — Spreadsheet

@ £65 incl. VAT (postage extra £2)



The 64 Software Centre, 1 Princeton Street, London WC1

Please supply **MASTER/SENIOR/PRACTICALS/BUSINESSMAN'S/HOUSEHOLDERS** package (for Master package state preference Spreadsheet/Database/Word processor) Cheque/Money Order for £ _____ enclosed/Please charge to my Access/Visa card No _____ expiring on _____

NAME _____

ADDRESS _____

TEL NO _____

SIGNATURE _____

The SED chip is more more well suited for such a command, CLG, SCROLL, SYNCH and WAVE. These functions are to clear the SED chip, to play a note, to set an envelope and to set a waveform respectively. As with the other commands the sound commands come with explanations and small demos, but throughout the manual there is a lack of demo programs for the user. There should at least be a few routines to give the user a start for their library.



ACOS+ runs at £2.95, and for your money you get a tape with the tapes, a tape format program and a game writers code ACOS+. There is also a 40 page manual. The object in using this package, as in using any extension to the resident Basic on your mac, is to make programming easier and faster. The 40 is probably in more need of this than most mac's, that is if you use Basic. The problem with all of these packages is the content loading before having access to the extra commands or extending programs overlap with the package.

Format

The utility must be loaded and installed before any of the features of ACOS+ can be used. Once installed, you can load the tape format program to format your cassette, which also adds a directory to the front of the tape. The usual SAVE and LOAD commands are replaced by CLLOAD and CSAVE. There are additional tape commands to load and update the directory, view and erase files, save or load a block of memory and verify a block of memory.

There are several commands that enhance the 64's resident Basic: HTAB and VTAB will move the cursor to the specified column or row, PLOT is a combination of the HTAB and VTAB commands. There are two familiar commands DEEK and POKE, which are a 16 bit PEEK and POKE. There is a MOVE command which allows the user to transfer a block of memory, which could be used instead of the COPY command.

The commands RASTERON and RASTEROFF redraw and erase the interrupt screen. RASTERON is used to give graphic displays to be flicker free. The PLAYER command sets some parameters to set and define the player, the

command MISSILE is set and defined in the same way allowing the user to vary set up, position, speed and boundaries. There are of course commands for sprites, with which the user can return the X and Y positions of a sprite and set colour and direction.

Sound

The SED chip is not ignored by ACOS+. There is a range of set word commands to allow any use of the SED. The user can use VOLUME, SWELEAVE, WAVEFORM and PULSE along with all the commands to set up and create sounds or synthesizers. Part of the user's manual is dedicated to explaining how to use these commands, and using the tape utility.

ACOS+ also has a demo game for users to sample. One final powerful command is UNIB. This allows the user to redefine any of the existing ACOS+ commands, or add new commands of their own to the existing commands. How about that? A utility that you can build on, what more could you want?

ACOS+ is very good, the performance comes up to expectations, and all of the commands will make life easier for those tired of using the 64's long winded Basic. The bottom line, as always, must be, "do you need it" and "would it be a good purchase?" At £2.95 it's certainly not expensive.

Moving along, Turbo Extended Basic costs £24.95 and is produced by Acme Software. The program is cassette based and comes with a 11 page manual. This package is similar to ACOS+, with the programs of the tape utility.

There is a great range of commands, and we'll sample some of them to get a picture of the use of Turbo Extended Basic.

The first group of commands are devoted to sprites, in order to simplify sprite creation and manipulation. With commands like BCOL, MOVE, OFF, PUT, SET and SPRITE sprites can be defined, moved and deleted. The command BCOL will check for background collision, and there is also a command for sprite to sprite collision. MOVE does just that, moves specified sprites. To turn sprites off simply use OFF, to turn them on, SET defines sprites and SPRITE places a sprite at specified locations.

Graphics

There are some nice graphics commands, as well as the usual ones — the by now familiar BGR (border colour), CLG (clear graphics screen) and DRAW (draw a line). There is also a CIRCLE command, a fairly needed FILL command (fills a block of memory with specified characters). There is also a BIRDS command which sets up a line screen with a specified colour, LINE controls the character colour, and LINE allows you to draw a line with specified coordinates on the screen. LINE may be used with MODE, which allows drawing or erasing. Each pixel on the line screen can be set on or off with PSET and PUNSET. The background colour is set with PAPER.

The last group of commands come under

the general heading of output. There are 19 commands under this heading, so only the essential ones will be looked at.

The first command is PUT, is used on Apple's range of mac's. This is a most useful command, allowing you to remove the last return from a GOSUB off the stack. So if you are in danger of overflowing the stack, PUT can be used to pull the last RETURN address off, most useful where many GOSUB's are used. Turbo adds a PRINT AT command and a BODE (double pointer) command. There are two commands for setting memory HIM and LOM, using these commands the top and bottom of memory can be used for code programs, alternate screens or character sets.

The command KRT waits for a key press and jumps to a line specified by the actual key pressed. This is a very compact and powerful command. The user can also SWOP lines screens, other commands include TEXT, REPEAT, UNIB and PAUSE.

Price

Turbo performs reasonably well and compares well with ACOS+ on the whole, but not on the other features, and certainly not on presentation of tape and manual. ACOS+ also outstrips this package on price, a very important point to many of us.

If you're not looking off, here about a £4 Doctor! It will only cost you £19.95 for disk or £17.95 for tape, and your 64 can get a return in the purity of your own house.



The package is produced by Computer Software Associates, and takes the hard work out of detecting hardware faults. 64 Doctor consists of a tape or disk with a 6 page instruction manual. To use the program, simply load and run it.

The program has a pictorial menu consisting of the keyboard, printer, disk drive, TV, Audio, cassette, joystick and RAM. The user can select between these areas and perform a number of diagnostic tests.

Testing the video display on TV surely allows the user to fine tune the unit, so that the display and colours are at the best position possible. The Audio test runs through a scale on each note of the SED chip. If you can hear the scales then all is well, if not then something is wrong (although it's not clear what). The

The 64 Software Centre

1, Princeton Street, London WC1. Tel 01-430 9034

The specialist centre with the widest range of software for the Commodore 64 and the best service. Open 10am/5pm (incl. Saturdays) Demonstrations facilities

● BUSINESS SOFTWARE:

Accounts, Stock Control, Database Systems, Spreadsheets, Statistics, Charts, Budget, Word Processors.

● HOUSEHOLD ACCOUNTS:

Banking, Budgeting, Word Processors, Databases.

● UTILITIES & AIDS:

Simon's Basic, BC Basic, Turtle Graphics, Ultrabasic, Pal, Mikro Assembler, Hasman 64, Victree, Master 64, The Tool, Graphics Designer, Sprite Aid, Turbo Ext. Basic, Acas +, Zoom Pascal, Forth 64, Logo, 64 Doctor, Omisynth, Synth 64, Scope.

● EDUCATIONAL:

Maths, Biology, Chemistry, Physics, History, Geography, French, Italian, Spelling.

● SIMULATIONS:

War, Flying, Golf, Boxing, Stock Exchange, Commodities.

● GAMES & ADVENTURES:

English and American (Cassette, Disk, Cartridges).

● COMPUTER COURSES:

Dr Watson's Basic and Assembler for Beginners, CBM 64 Tutor.

Friendly assistance and advice given. Export orders welcome. Immediate despatch for mail and telephone orders (Access, Visa, Eurocard, Mastercard). Discounts for package deals.

4) joystick and displays as 3-dimensional scenes on the screen, and allows you to test the stick by moving it. The five buttons may also be tested. Both ports may be tested and a list of possible faults is given if the test fails.

The Keyboard test is fairly comprehensive, and allows the user to test most of the keys, displays them on the screen, and marks them as they are pressed. Obviously if there is a fault here then it is fairly serious, and your machine will need expert 'doctoring'. To test the drive a blank disk is needed. The SAVE, LOADS and read-write functions are tested as well as the internal DOS functions. The printer test merely prints all of the ASCII characters three times.

Checked

This cassette disk also has been checked; it will check all of the normal cassette operations and report any failures. The 4K RAM can be checked; this can be a useful check on a common check (overnight). There is an auto-test which will test the drive, RAM and printer displaying the results on the screen. The checks, which are auto or manual, will be passed or failed, and marked as checked.

There is not much more one can say about the utility, except that it could be useful for minor faults, but how do you test the driver if your disk is faulty and the program won't load?

From Oxford Computer Systems comes **Oxford Pascal** for the 64. They claim that this version is a complete implementation

of Pascal, and in addition takes full advantage of the 64's features.

The package comes on disk or cassette, and has demo programs and a game. There is a comprehensive manual and a sheet of instructions for the manual. The program will test a bug, which Oxford Computer Systems say they are searching for. The disk



version is priced at £49.95, and the cassette version is £24.95.

Pascal allows you to escape from Basic, and potentially gives you a faster, more flexible and complex language. Programming in Pascal is more structured than in Basic, and Pascal programs need to be compiled and saved before use. There is a standard compiler which will compile and

then execute programs for screen. Full error messages are given.

One disadvantage is the amount of RAM left when the Pascal editor and compiler are in memory, but the memory available can be increased by disabling the compiler and compiling source programs from disk. If there is still not enough room for your programs, then they may be channelled together with various techniques.

Further

The package comes with many i-o commands as well as commands for the editor and compiler. Compiling and testing programs is very fast, perhaps five times faster than Basic. Pascal programs are certainly easier to write and follow than Basic, but there are more restrictions on the programmer. OCS Pascal includes a powerful multi-colour graphic editor.

Most graphics become very simple to use, no more PEEKs and PULKEs, just simple commands. Text windows are supported, and sound is also tested. So not only are you getting another language, but also more powerful commands as in an extension to Basic.

OCS has now developed a Microcomputer program which will be used as an in-house utility. This will enable the main body of a language compiler to be generated quickly and easily, cutting production time and development costs smaller. Hopefully this means that we'll be seeing further compilers for a range of languages for the 64, and we'll be looking at these utilities as they become available. ■

CBM64 AND VIC20



LOGIC

TEST YOUR POWERS OF LOGIC
AGAINST THE COMPUTER OR ANOTHER
BEWARE! HIGHLY ADDICTIVE!



146 BOTTLES OF LOGIC IN - RETURNED BY EXPRESS
1 BOTTLE (ONLY 146) for less than the price of one!

DETROIT RUN

Who will win? It's a choice for Detroit Traffic. From 1980 to 1982, it's a choice for the city. Detroit will win or lose. The other choice is to win or lose. The other choice is to win or lose.



- £5.90 - ☐ BARGIC (any expanded VIC) or CBM64
- £5.99 - ☐ DETROIT RUN/GHOST PATROL (Unexpanded VIC) The popular two-for-the-price-of-one on one cassette. All Machine Code Arcade Action.
- £7.99 - ☐ SCAN SPECIAL OFFER (for VIC owners) LOGIC plus DETROIT RUN/GHOST PATROL.
- £16.50 - ☐ INTERFACE & CABLE for BROTHER 6P22 (Ready to plug in to VIC 20 or Commodore 64)
- £20.00 - ☐ FULL RS232 INTERFACE (7 foot, cable is not included but can be supplied, requires welcome)

While stocks last. Don't miss it going.

Send cheque or postal order to

SCAN PRODUCTS

46 RIVER LANE, GAYWOOD, KINGS LYNN, NORFOLK.
PCN 0410. Telephone: (0945) 51 581

Please send following

☐ ☐ ☐ ☐ ☐ (tick)

Name

Address

County

Postcode

Please tick cheque/P.O. for £, payable to SCAN PRODUCTS

JOHN CLARKE, acting as a development manager for CompuLink, explained the role of CompuLink and its company, ADP Network Services:

"ADP and CompuLink are jointly developing CompuLink. Essentially it's like to use the service becoming fairly independent, as Microsoft is independent from Perot. Our aim is to provide a sort of market place, allowing you to wander through the screen and use the sort of facilities which we can provide. Obviously the service will be similar to Microsoft in some ways, and different in others, for instance, usually we won't have the huge database which Microsoft can offer through Perot, but I feel that we have more to offer in terms of technical reliability, among other fields, and we're hoping to introduce software which will enable CompuLink users to access Perot."

Research

CompuLink is now a working service, but numbers of modems available are being kept down until more checking has been done. "It's not an availability problem — we should be shipping out modems in large quantities by July — but at the moment the BCFAC members who have been given access to modems are helping us to research the system."

At the June CompuLink Show, where we talked, the CompuLink stand was bustling and questionnaire which John hoped would give a better idea of the use

of service the public expected from CompuLink.

"Obviously some of the ideas we have are already well established. We'll be offering teleshopping, through a system called CompuShop, and an account service by which you can exchange messages with other users. We're negotiating with a major bank to offer a banking service, though this idea isn't finished yet. There's an area we call The Jungle, where you can get to know through seeing what other users have to say or what software they can offer. So far as the user software is concerned it's going to be very much a matter of user choice, but of course we'll be offering commercial software for downloading at a considerable saving. Part of the reason why commercial software licenses are attractive to CompuLink is that we'll incorporate a security system into each modem. Software downloaded from the system will not run without the modem in place — and that's not just any modem, but the specific modem which was used for downloading. We're also doing the best we can to make sure that the signal quality is reliable, and there's an error checking protocol which should make the whole system very reliable."

Flexible

CompuLink's menu system makes it appear very easy to use, despite perhaps like the various separate services — Cinema, Cards and Perot. "I certainly get confused using separate systems, but CompuLink leads you through whatever you

Time make modem

*With computer accessibility,
becoming one of the
Chris Jenkins talks to
and Microsoft*

want to do, and makes it easy to find the services you want to use. Of course the flexibility of CompuLink is much greater than that of separate systems, so we're actually trying to compare it to a menu. We might not be able to offer such a large database, but then the Perot information service hasn't exactly been aimed at the BCFAC user. What we're trying to do is give users the services they want — they'll be able to do things like ordering books, records, music, bulk groceries — and we'll charge a small commission on each item service, so we'll use user software which is sold through the jungle screen."

CompuLink's drive now is designed to attract service providers, so that more the system is fully operational a large range of facilities will be available. For the first three months the modem cartridge will be available only on mail order from CompuLink, but by the Autumn it will be available from computer dealers. "The cost of the modem cartridge will be £99.95, and this includes a year's free subscription to CompuLink. Subsequent years will cost £29. We have a 1200/30 baud system at the moment, although in London there's a 1200/1200 system which we're making available to suit more homes for uploading programs. Hopefully there'll be a complete 1200/1200 full duplex network eventually. Connect time charges will work out at something like 10 p per hour at peak times."

CompuLink

John Clarke clearly believes that there is room for CompuLink to develop in competition with the longer-established Microsoft. "What we have here is a great way of getting out information — for instance, what about a service offering electronic 'reports' of back issues of computer magazines? You could look through for articles you'd missed on a subject in which you were interested, then order a copy or have it printed out. That's just one idea — obviously the more you think about it the wider the range of possible services becomes. The public will only buy communications systems on the basis of what's there — what we're trying to do is to make sure that CompuLink gives them what they want."



John Clarke of CompuLink — it's not what they want

to your choice

able information networks now
of the industry's growth areas,
is to Computer's John Clarke
and Yon Rock

MICRONET representative Yon Rock explained that the service was launched in March 1983 and has about 900 thousand subscribers.

"Essentially Pronet is a massive information service, and Micronet forms part of it, as a wholly independent organization Micronet does three things — it provides communications facilities, so that once you're linked on to your system you can send letters, diagrams and so on.

"There's also a bulletin board, where you can leave any kind of message you want, either personal messages or company problems or miscellaneous messages. There's now also a screen for Statnet, an otherwise abandoned player publicizing strange price wars by Mike Singleton."

"The second thing Micronet does is to offer the ability to download software. Currently BBC, Spectrum, Apple and Pro users can access around 80 or free programs and fifty commercial ones. This facility will now be available for the Commodore 64, and games software will be about 30% cheaper than it would be if you bought it from a shop."

Scope

But what can explain that MICRONET members were helping with the development of the 64 service, and that software houses like Amiga, Bubble Bus, Llamasoft and Singleton would be making software available? "One trend is that we're adding in our own games software — there's a lot of scope for us to provide images, educational and utility programs — we'd like to push all three areas equally."

Future plans include a service called Executive Micronet and an expanded education service. "Head Start will be a home learning service providing educational software for 5-12 year olds and new parents. Richard Lark will start on the Apples, and that's a service dedicated to secondary schools. We're looking on the future towards things like Christian homework." Having made the question of how popular that idea would be with the children less awkward to explain Executive Micronet.

"It will act as a database of information for the small businesses — giving advice on

software and providing, for instance, examples of form letters. Ultimately we'll have a range of downloadable software, initially for the Microseries."

"The third main type of Micronet is information, which is more apparent because it's instantaneously updatable service. As far as the 64's concerned, it will have a large database with news, reviews, features, interviews, details of courses and so on."

Yon claims that it's within this long to introduce a 64 service on Micronet because alternative offers have been made to make the system 100% right. "There were technical difficulties to be overcome — for instance accurate modem users aren't reliable as they might have been, and they're now giving way to hard wired modems."

"Once you've got your 64, you'll need a modem and a firmware cartridge. The modem we recommend is the Modem 1000, which plugs into the new standard Telecom jack socket. The cartridge actually does the downloading of the software, and you will find that there's no alternative to this cartridge commercially available. The cartridge will be about £30, and the modem £70 or £80. Since the modem has already been approved we aren't having to wait like other manufacturers are."

Charges

To join Micronet all you need to do is buy the modem and the cartridge, then fill in an application form. Standard charges are:

£13 per quarter, with extra for telephone connection time. "Once most communication is off-peak times at local rates, charges tend to be about 40p per hour. The weekly 'phone bill' and in order for into people's homes, but as I say most people don't become subject to the 1p per minute daytime connection fee. The extra charge you'll see on your bill are for any time that you've ordered through the 'telephones' service, and charges for commercial software you've downloaded."

With around 3½ million 'trans accounts' being made to Micronet in the month of April, it's clear that the service is one of the most popular aspects of Pronet. "Micronet has brought Pronet to the attention of the mass in the street, and as many users has been the saving grace of Pronet. We're aware that we have to stay ahead — Micronet is an instantaneous service, and we're planning to take people away from the use of computers for themselves. Certainly computers as we know them will change — there'll be no reason to have a computer as the home as part of an information service."

But it improves that the names used for Commodore's mail service, Compuserve, will be more than Micronet's, is a personal one. "We've blazed the trail and paid the penalties of being first in the field. The question is whether Compuserve will learn from us — at any case, it's an expanding market and the competition will be a good thing." ■



Yon Rock of Micronet, a spokesman for the service

[illegible]

Connective 64—Akivita
Small business/home use
Also needed: disk drive, printer
Now from Microsoft

Plans? Forecasts? Models? Your instant answers to 'What If' questions

What the papers say

"Multiplan is without question the spreadsheet that has answered almost all the objections which could be levied at all others of its kind. If it is so far ahead of all the others, the busy reader can simply make a note that Multiplan is the spreadsheet to get."

Karl Orlitz
Commodore User

**MICROSOFT
MULTIPLAN.**

Electronic
Worksheet

The most powerful electronic worksheet

For personal, business or educational computing everything that can be expressed in columns and rows can be simplified by **Multiplan** into a fast-updating, fast decision-making tool. Adopted without loss from the original Microsoft IBM/Apple program, this disk is now ready for your 64 at **half the price!**

Features include: 255 rows, 63 columns for building models. All prompts and manual in easy English that is understood, financial, trigonometric functions, 8 screen windows. Algebra, numeric sorting, inter-worksheet linking. Flexible formatting for pro-quality reports.

Call Product Line (0252) 518364

Use our specialist advice unit
for queries on program use.
This service is free to both
users and stockists.

Your copy of this program

Here's **Multiplan** (Cat. No. HSB242)
is available from all good computer
software stockists. Recommended
retail price £95.00 including VAT.
Send me (tick as required)

The address of my nearest stockist

A full specification for this program

Your full list of business products

Please allow 21 days for response

To: Thom DMI Computer Software Distribution
295 Farnborough Rd., Farnborough, Hants, GU14 7NF

Name _____

Title _____

Company _____

Address _____

Tel. _____

AD43



THOM DMI
Computer
Software
Distribution

COMPUTER SOFTWARE DISTRIBUTORS FOR: CREATIVE SPARKS/HESWARE/ILS/MANIFEST/TOTL/ORDMASTER/ALAN KIDG/ROSESOFT

[illegible]

VALH

**GAME
OF THE YEAR
BMA'84**

**Available Now for
Commodore 64**

VALHALLA

MOVI
SOFT

COMMODORE 64
& 48K SPECTRUM



VALHALLA is available for Commodore 64 and 48K Spectrums, and is supplied with VALHALLA player manual and programming list.
VALHALLA is normally available from shops, and orders are despatched by express. If for any reason we are unable to fulfil your order within 14 days of receipt we will notify you.

VALHALLA is supplied using an unconditional licence (no payment) pursuant to Commodore's VALHALLA Licence. Commodore games remain, direct not supported. Spectrum VALHALLA, its printer options, instructions and full user manuals not supported.

NO OTHER (not long) floppy contains the program and PROGRAMS with your program if made payable to VALHALLA.

OR TELEPHONE (0203) 200000. Mon-Fri. 9-5.30, stating name and address, time by day, month received.

DEALERS: Please contact your regular distributor.
COMPTON (UK) LTD (0203) 200000 (Customer Services), National Centre, Bull Road, Huddersfield, West Yorkshire.

©1989 MOVI SOFTWARE. ALL RIGHTS RESERVED.

Post to - LEGEND FIREPOST
P O BOX 438 LONDON E4

Please send me
copy/copies of
VALHALLA for the
COMMODORE 64

Please send me
copy/copies of
VALHALLA for the
48K SPECTRUM

I enclose cheque/P O for £
(£14.95 incl. VAT and P&P)

Or I wish to pay by Access/Bankcard/Misc

Card No.

Please print name and address

Name

Address

Credit Card holder's signature



8

[illegible][illegible]

UNIVERSAL COMPUTER PRODUCTS

<p>• EPOCH PROGRAMMING FOR THE IBM AND compatible systems</p> <p>Professional software for programming in assembly language</p> <p>UNIVERSAL 15 IBM PC compatible, 1500 lines, 1000 instructions, 1000 variables, 1000 constants, 1000 labels, 1000 comments, 1000 macros, 1000 subroutines, 1000 functions, 1000 procedures, 1000 modules, 1000 packages, 1000 libraries, 1000 systems, 1000 utilities, 1000 drivers, 1000 controllers, 1000 interfaces, 1000 protocols, 1000 standards, 1000 specifications, 1000 requirements, 1000 constraints, 1000 limitations, 1000 exceptions, 1000 errors, 1000 warnings, 1000 messages, 1000 alerts, 1000 notifications, 1000 indications, 1000 suggestions, 1000 recommendations, 1000 instructions, 1000 commands, 1000 requests, 1000 queries, 1000 questions, 1000 answers, 1000 responses, 1000 actions, 1000 reactions, 1000 events, 1000 occurrences, 1000 incidents, 1000 accidents, 1000 disasters, 1000 catastrophes, 1000 crises, 1000 emergencies, 1000 situations, 1000 circumstances, 1000 conditions, 1000 states, 1000 modes, 1000 levels, 1000 degrees, 1000 amounts, 1000 quantities, 1000 numbers, 1000 figures, 1000 statistics, 1000 data, 1000 information, 1000 knowledge, 1000 wisdom, 1000 understanding, 1000 insight, 1000 intuition, 1000 instinct, 1000 feeling, 1000 emotion, 1000 passion, 1000 desire, 1000 will, 1000 power, 1000 strength, 1000 courage, 1000 bravery, 1000 valor, 1000 heroism, 1000 gallantry, 1000 chivalry, 1000 nobility, 1000 honor, 1000 glory, 1000 fame, 1000 reputation, 1000 prestige, 1000 status, 1000 rank, 1000 position, 1000 role, 1000 function, 1000 duty, 1000 responsibility, 1000 obligation, 1000 commitment, 1000 dedication, 1000 devotion, 1000 loyalty, 1000 fidelity, 1000 faith, 1000 trust, 1000 confidence, 1000 belief, 1000 conviction, 1000 opinion, 1000 view, 1000 perspective, 1000 outlook, 1000 attitude, 1000 mindset, 1000 philosophy, 1000 ideology, 1000 doctrine, 1000 theory, 1000 hypothesis, 1000 model, 1000 framework, 1000 structure, 1000 system, 1000 method, 1000 technique, 1000 approach, 1000 strategy, 1000 plan, 1000 policy, 1000 procedure, 1000 protocol, 1000 standard, 1000 specification, 1000 requirement, 1000 constraint, 1000 limitation, 1000 exception, 1000 error, 1000 warning, 1000 message, 1000 alert, 1000 notification, 1000 indication, 1000 suggestion, 1000 recommendation, 1000 instruction, 1000 command, 1000 request, 1000 query, 1000 question, 1000 answer, 1000 response, 1000 action, 1000 reaction, 1000 event, 1000 occurrence, 1000 incident, 1000 accident, 1000 disaster, 1000 catastrophe, 1000 crisis, 1000 emergency, 1000 situation, 1000 circumstance, 1000 condition, 1000 state, 1000 mode, 1000 level, 1000 degree, 1000 amount, 1000 quantity, 1000 number, 1000 figure, 1000 statistic, 1000 data, 1000 information, 1000 knowledge, 1000 wisdom, 1000 understanding, 1000 insight, 1000 intuition, 1000 instinct, 1000 feeling, 1000 emotion, 1000 passion, 1000 desire, 1000 will, 1000 power, 1000 strength, 1000 courage, 1000 bravery, 1000 valor, 1000 heroism, 1000 gallantry, 1000 chivalry, 1000 nobility, 1000 honor, 1000 glory, 1000 fame, 1000 reputation, 1000 prestige, 1000 status, 1000 rank, 1000 position, 1000 role, 1000 function, 1000 duty, 1000 responsibility, 1000 obligation, 1000 commitment, 1000 dedication, 1000 devotion, 1000 loyalty, 1000 fidelity, 1000 faith, 1000 trust, 1000 confidence, 1000 belief, 1000 conviction, 1000 opinion, 1000 view, 1000 perspective, 1000 outlook, 1000 attitude, 1000 mindset, 1000 philosophy, 1000 ideology, 1000 doctrine, 1000 theory, 1000 hypothesis, 1000 model, 1000 framework, 1000 structure, 1000 system, 1000 method, 1000 technique, 1000 approach, 1000 strategy, 1000 plan, 1000 policy, 1000 procedure, 1000 protocol, 1000 standard, 1000 specification, 1000 requirement, 1000 constraint, 1000 limitation, 1000 exception, 1000 error, 1000 warning, 1000 message, 1000 alert, 1000 notification, 1000 indication, 1000 suggestion, 1000 recommendation, 1000 instruction, 1000 command, 1000 request, 1000 query, 1000 question, 1000 answer, 1000 response, 1000 action, 1000 reaction, 1000 event, 1000 occurrence, 1000 incident, 1000 accident, 1000 disaster, 1000 catastrophe, 1000 crisis, 1000 emergency, 1000 situation, 1000 circumstance, 1000 condition, 1000 state, 1000 mode, 1000 level, 1000 degree, 1000 amount, 1000 quantity, 1000 number, 1000 figure, 1000 statistic, 1000 data, 1000 information, 1000 knowledge, 1000 wisdom, 1000 understanding, 1000 insight, 1000 intuition, 1000 instinct, 1000 feeling, 1000 emotion, 1000 passion, 1000 desire, 1000 will, 1000 power, 1000 strength, 1000 courage, 1000 bravery, 1000 valor, 1000 heroism, 1000 gallantry, 1000 chivalry, 1000 nobility, 1000 honor, 1000 glory, 1000 fame, 1000 reputation, 1000 prestige, 1000 status, 1000 rank, 1000 position, 1000 role, 1000 function, 1000 duty, 1000 responsibility, 1000 obligation, 1000 commitment, 1000 dedication, 1000 devotion, 1000 loyalty, 1000 fidelity, 1000 faith, 1000 trust, 1000 confidence, 1000 belief, 1000 conviction, 1000 opinion, 1000 view, 1000 perspective, 1000 outlook, 1000 attitude, 1000 mindset, 1000 philosophy, 1000 ideology, 1000 doctrine, 1000 theory, 1000 hypothesis, 1000 model, 1000 framework, 1000 structure, 1000 system, 1000 method, 1000 technique, 1000 approach, 1000 strategy, 1000 plan, 1000 policy, 1000 procedure, 1000 protocol, 1000 standard, 1000 specification, 1000 requirement, 1000 constraint, 1000 limitation, 1000 exception, 1000 error, 1000 warning, 1000 message, 1000 alert, 1000 notification, 1000 indication, 1000 suggestion, 1000 recommendation, 1000 instruction, 1000 command, 1000 request, 1000 query, 1000 question, 1000 answer, 1000 response, 1000 action, 1000 reaction, 1000 event, 1000 occurrence, 1000 incident, 1000 accident, 1000 disaster, 1000 catastrophe, 1000 crisis, 1000 emergency, 1000 situation, 1000 circumstance, 1000 condition, 1000 state, 1000 mode, 1000 level, 1000 degree, 1000 amount, 1000 quantity, 1000 number, 1000 figure, 1000 statistic, 1000 data, 1000 information, 1000 knowledge, 1000 wisdom, 1000 understanding, 1000 insight, 1000 intuition, 1000 instinct, 1000 feeling, 1000 emotion, 1000 passion, 1000 desire, 1000 will, 1000 power, 1000 strength, 1000 courage, 1000 bravery, 1000 valor, 1000 heroism, 1000 gallantry, 1000 chivalry, 1000 nobility, 1000 honor, 1000 glory, 1000 fame, 1000 reputation, 1000 prestige, 1000 status, 1000 rank, 1000 position, 1000 role, 1000 function, 1000 duty, 1000 responsibility, 1000 obligation, 1000 commitment, 1000 dedication, 1000 devotion, 1000 loyalty, 1000 fidelity, 1000 faith, 1000 trust, 1000 confidence, 1000 belief, 1000 conviction, 1000 opinion, 1000 view, 1000 perspective, 1000 outlook, 1000 attitude, 1000 mindset, 1000 philosophy, 1000 ideology, 1000 doctrine, 1000 theory, 1000 hypothesis, 1000 model, 1000 framework, 1000 structure, 1000 system, 1000 method, 1000 technique, 1000 approach, 1000 strategy, 1000 plan, 1000 policy, 1000 procedure, 1000 protocol, 1000 standard, 1000 specification, 1000 requirement, 1000 constraint, 1000 limitation, 1000 exception, 1000 error, 1000 warning, 1000 message, 1000 alert, 1000 notification, 1000 indication, 1000 suggestion, 1000 recommendation, 1000 instruction, 1000 command, 1000 request, 1000 query, 1000 question, 1000 answer, 1000 response, 1000 action, 1000 reaction, 1000 event, 1000 occurrence, 1000 incident, 1000 accident, 1000 disaster, 1000 catastrophe, 1000 crisis, 1000 emergency, 1000 situation, 1000 circumstance, 1000 condition, 1000 state, 1000 mode, 1000 level, 1000 degree, 1000 amount, 1000 quantity, 1000 number, 1000 figure, 1000 statistic, 1000 data, 1000 information, 1000 knowledge, 1000 wisdom, 1000 understanding, 1000 insight, 1000 intuition, 1000 instinct, 1000 feeling, 1000 emotion, 1000 passion, 1000 desire, 1000 will, 1000 power, 1000 strength, 1000 courage, 1000 bravery, 1000 valor, 1000 heroism, 1000 gallantry, 1000 chivalry, 1000 nobility, 1000 honor, 1000 glory, 1000 fame, 1000 reputation, 1000 prestige, 1000 status, 1000 rank, 1000 position, 1000 role, 1000 function, 1000 duty, 1000 responsibility, 1000 obligation, 1000 commitment, 1000 dedication, 1000 devotion, 1000 loyalty, 1000 fidelity, 1000 faith, 1000 trust, 1000 confidence, 1000 belief, 1000 conviction, 1000 opinion, 1000 view, 1000 perspective, 1000 outlook, 1000 attitude, 1000 mindset, 1000 philosophy, 1000 ideology, 1000 doctrine, 1000 theory, 1000 hypothesis, 1000 model, 1000 framework, 1000 structure,</p>

FEATURES for the VICER!

- 20Kbps
- multi-Packet
- spread
- low power consumption
- integrated controller
- wireless data port

finally!
20 kilobits per second
from ZERO!

JURY!



VIC 20

128K RAM • 256 Programs
VIC 20 is a powerful, versatile computer. It's the only computer that can do everything you need it to do. It's the only computer that can do everything you need it to do. It's the only computer that can do everything you need it to do.



VIC 20

128K RAM • 256 Programs
VIC 20 is a powerful, versatile computer. It's the only computer that can do everything you need it to do. It's the only computer that can do everything you need it to do. It's the only computer that can do everything you need it to do.

EXPANSION
and a new line of
products. The new
line includes a
new line of
products.

[illegible][illegible][illegible]

Design a new character set for your Vic 20

David Shepherdson demonstrates how to give your Vic a pointless facelift

THIS CHARACTER Worksheet program is one which I developed from an older one developed to help me design my own Vic 20 character set for a program as, at that time there was no suitable program available. The original required an extra 16 KVM and, although it was effective, it was rather clumsy. This version will fit into an unexpanded VIC-20 (in +32K) and by entering the following in either a direct command or within another program, it will fit into a +32K VIC.

POKE 440,31:POKE 441,30:SYS 65551

In this case, remember to take out the POKE 440 & POKE 441 in line 68.

If you would like to describe what the program does and how to use it, then enter various numbers 0s and other stuff, or letters.

To use the program, simply load it and run. There are no particularly unusual POKEs in it, but I do recommend saving and verifying it once you have entered it.

Once started, an eight by eight grid is displayed with letters (starting Top to Bottom, and Number on both sides). To

block in a square, simply enter the co-ordinates later first, then number. If you decide that the letter you to have that particular block valid, then simply re-enter the same co-ordinates. This will remove the block. When you are entirely satisfied with the display, or simply wish to see what the character looks like, then press 'S'. Whilst a screen is on, your VIC will display, on the left of the grid, alongside each row, the decimal value of each row. These values are the required decimal figures for placing into your own programs as DATA.

Character worksheet program

```

0 DIMX(17),Y(17),Z(17),F% CLR
10 PRINTCHR$(147):F%="":KEY KEY TO CONTINUE"
15 GET"CRR"$(CHR$(1000))
20 CRR=" "
25 GOSUB60000:POKE798,134
30 S=36873:SS=53:1:SA=55:4:SC=7839:CO=38720:POKE59,29:POKE58,10
40 TL$="CHARACTER WORKSHEET"
45 IFPEEK(178)=24ANDPEEK(7679)=0THEN600
50 PRINTTL$:FORI=8TO512:POKE7168+I,PEEK(32768+I):POKE54,PEEK(25600+I):NEXT
60 POKE54,0:POKE59,29:POKE58,0:POKE128,0:POKE58,0
70 GOSUB100:GOTO280
80
100 PRINTTL$
110 FORI=798TO881:GETSTEP22:FORJ=8TO7:K=0+J:POKEK,79:POKEK+CO,0
120 NEXTJ:1:FORI=1TO8:POKE50+I,1+128:POKE50+I+CO,0
130 FORIH=0TO7+1:1+128:POKE50+CO+1,0:NEXT I:S=177
140 FORI=7076TO8023:STEP22:POKEI,0:POKEI+9,0/9=S+1
150 POKEI+CO,0:POKEI+9+CO,0:NEXT POKE128,0
160 PRINTCRR,RIGHT$(CRR,2),"ENTER LETTER FIRST,"PRINT" 'S' TO SEE VALUES"
170 PRINTCRR:RETURN
180
200 PRINTCRR," ",CHR$(157),CHR$(157),
210 GOSUB500:IFRR$(V%CRRL)=""THEN610
220 PRINTRR, :$=ASC(RR)-64
230 GOSUB500:IFV%CRRL=""THEN600
240 PRINTRR:SS=160:V%=SC+V%22+K:IFPEEK(V%)=102THEN600+79
250 POKEV,00:V%=0:V%=0:GOTO280
260
280 POKE128,0:POKE204,0
310 GETRR:IFRR=""THEN510
320 POKE204,1:IFRR="S"THEN1000
330 V=ARR(RR):RETURN

```

Continued on page 29


```

540
550 PRINTCHR$(K); IF (PEEK(652)=894)PEEK(197)=64:THG=600
610 RETURN
620
1000 SP=7665 FORI=6707 ZC(1-6)=SP FORJ=1707 ZC(1-3)=ZC(1-6)+J NEXT
1010 SP=67422 NEXT
1020 FORI=6707 TO(1)=0 FORJ=6707 DFPEEK(ZC(1-3))>C:1607=67040
1030 TO(1)=TO(1)+240 ZC(1-3)=1
1040 NEXT PRINTLEFT$(CHR$(9+I),TX(I))
1050 NEXT
1060
1200 RS=CHR$(16) OS=CHR$(145) PRINTCHR$(RS;"E",OS,
1205 PRINT"MAPLE "RS;"O"PRINT RS;"R"OS"ESTART", POKE190,0
1210 GET#0 IF#0="":THEN1210
1215 IF#0="E"THEN0000
1220 IF#0="O"THEN0040
1230 DF#0="R"THEN0000
1240 IF#0="R"AND#0="O"THEN1210
1250 GOTO6000
1300
3000 PRINTTLB POKE39-10,205 PRINTLEFT$(CHR$(6),
3010 FORI=6707 POKE7560+I,TX(1) NEXT
3020 PRINTTAB(2);CHR$(280);"",SPC(5);CHR$(1440);"",SPC(5);CHR$(380);"",SPC(5);CH
R$(315);" "
3030 GOTO6000 PRINT#RS(147) POKE39-10,240
3040 COSUS1000 FORI=6707 FORJ=6707 IFZC(1-3)=1THENPOKEZC(1-3),200
3050 KX(1-3)=0 NEXTJ,I GOTO2000
3060
60000 IF#0=PEEK(652)AND1201=64#PEEK(3666)AND127=7660THG=RETURN
60010 PRINCHR$(;"CORRECT MEMORY") E=0
60020 SAVE#00 WORKSHEET":0
60030 VLPDPY"WORKSHEET":0

```

You may then push "E" to see what your new character looks like (as a example, the program will print it as four different columns) or by pressing "O" you can return to the grid to continue to draw the shape, or by pressing "R" you can start afresh. If you enter either "E" or "O" you can end the program and your VIC will start at its power up.

Characters

Now as far how it does what it does. Because of the difficulties of reading the Commodore Character and Color Characters in a program, I've used their character numbers instead with the exception of line 30 which is explained in line 31. To save time when running this program, I suggest that you use the Commodore & Color keys themselves.

A quick rundown of the ones I used might be useful.

They are CHR\$(37) = Center Down, 38 = Reverse On, 39 = Center Name, 38 = Red, 50 = Green, 51 = Blue, 144 = Black, 145 = Reverse On, 147 = Clear Screen & 157 = Center Left. By using Integer Variables in line 9 instead of normal numbers you solve within a DIM statement, about a third of a K was saved and by using loops to the full, quite a lot of memory was saved.

In line 25 the COSUS 90000 part checks that the screen is at the correct position. This is of course important was just because of the screen POKEs within the program but because of the Characters are requirements the POKE 76, 194 was not RUN - STOP key in case of accidents. However, it is still possible to stop the program by RUN - STOP with 885706K.

To cut this out, just add POKE 77190, 1 to line 25.

To save memory and time, I have standardized the most regularly used variables within many of my programs. Instead of VCL = 14444 etc, I decided upon 58 = 5879, 59 = 59 - 1 and so on. This way, instead of trying to remember which name I give to any of the named channels in a particular program, I just put which channel and use "5" with its last digit. For example, the white tone channel (Mitty), I always call 55. By having some standardization between your programs it's surprising how much time you can save.

Line 40 merely stops the setting up of the secondary character set if you are running the program for a second time. One point that I have not seen with any program yet published is that when defining characters, the screen will be blank and nothing appears and happens for a minute or so. I have solved an entire POKE to this section, where another section is placed into one of the named channels at the same time to give the user the impression that something is happening and that the VIC has not gone away to sleep.

Grid

The page at lines 60, 195-260 are a just instead of using "REM" on a colon to separate each routine for easier reading. These are obtained by starting a line number, pressing CTRL and MOV ON together, then SHIFT and M and finally SPACE. You should now have an address dash and space. Print return and hit to check the line. You should have a line number without anything following it.

The next screen POKEs to the screen the

light by eight grid with control letters and numbers. Lines 260 to 265 is the INPUT co-ordinates from the using GET#. It is never trapped and will only accept 'A' to 'H' for the first digit, and '1' to '8' for the second, although either will accept 'I' to use the values.

In line 265, Q is set to an inverse space, and PEEK(75) checks to see if the location pointed already holds an inverse space, if so, then it changes QQ to a grid pattern character. Lines 260 to 265 are simply the GET# routine. The problem this routine solves is clear the Keyboard Buffer and then (264) copies the screen to Blank. After the co-ordinate is entered, this is cut out.

Options

Lines 600 and 610 are a true "Any key to continue" routine. Instead of using GET# to check for a key press, (which does not check for Shift keys), this routine does. By PEEKing both 197 and 653 it is possible to check for ANY key. Location 197 checks for the usual keys, if no key is pressed then 197 holds the value of 64. Location 653 checks for Shift, CTRL & Color keys. If none of these is pressed, then 653 holds 255.

Lines 1000 to 1050 work out the values of the blockad in grid. X500 is set to 0 if a square is blocked in, if not, it is left as 0. This is to save you from re-work the grid.

Lines 1050 to 1058 set your own options, the RS = Reverse On, and OS = Reverse On. 573 64600 saves your Vic-to-Power Up Screen.

3000 on just prints the defined characters examples and then re-sets the (E) and returns you to the main program.

Control your 64 — master bit switching

John Cardell explains a crucial programming method

THE COMMODORE 64 is exceptional value with its standard keyboard, banks of memory, the fast sound chip in the hardware, sports graphics and extremely flexible operating system — that is, if you are capable of taking in the incredible amount of police and parks reported to arrest most of the people that the fast selling machine has to offer.

The handbook which accompanies the machine is dreadfully inadequate, so if you intend to do more than play games or run other people's programs, it will not be long before you start hunting the shelves at your local computer dealer for more practical information.

Knowledge

The *Commodore 64 Programmer's Reference Guide* will no doubt be your first port of call. This currently contains all the information that you need to become a professional programmer but unfortunately the guide assumes a more than average knowledge of Basic on the part of the reader. Other books have therefore heavily filled this gap — one or two are excellent, some average and quite a few considerably worse than others.

However, with perseverance and hours in the keyboard, you can reach the stage where you'll programs can become useful and worthy of exposure to others, especially in the area of textual software that is most in vogue, graphics and sound are attempted, things become horribly complicated.

Unfortunately, when you enter in Simon's Basic or one of the many graphics aids now available (and of course the

disadvantage with these values is that they immediately reduce the working for your software to only those users who have that specific package), you would be able to use the dreadful Basic 2 commands with confidence.

Most of the commands are adequately explained in the hardware and with practice their application will be understood. I have struggled with this problem for nearly six months now and the light is beginning to dawn through. I managed to clarify most of my difficulties by diligent investigation and good old fashioned try looking. My biggest problem was trying to find out what was meant by the following —

POKE \$100, PEEK(\$100) AND 10

OR

POKE \$100, PEEK(\$100) OR 10

These statements were used regularly in published programs and in the manuals and books covering the Commodore 64, but nowhere could I find an explanation of how the commands actually worked. Only later my decision to delve into machine code has the penny dropped, but had I known before what was happening things would have been much easier during my attempts to reach in and out locations on the 64's memory map. For that is what the two statements are all about, the switching.

I hope that the following will help to clarify this topic for you. If you wish to gain full benefit from the exceptional flexibility of the 64 then it is imperative that you fully understand the logic of these.

Your 64 contains basically (except of your 64000 memory locations) are used by the software rather pre-programmed into the computer in the form of Basic Only

Memory (ROM), or by that which you enter through the keyboard or from some outside storage source such as tape, disk or cartridge. A number of these memory addresses or locations are pre-coded by the manufacturers to have special functions, for instance, to switch on or off sound channels, video banks, input-output devices etc. One of the major advantages of the 64 is that these locations can be manipulated and different functions achieved by the programmer.

Before we can look at how to carry out these operations, it will be necessary to take a look at how the memory addresses or bytes are laid up. Any one address or location consists of one byte, and as most of you will know a byte is more fundamental when it comes to switching on and off as bits. Each byte consists of eight bits or switches and each one of these bits can represent a binary digit.

Binary

There is not room here to discuss binary mathematics in detail, however the information is available in any introductory textbook on computer programming. In short, binary is a number system which uses only two digits, 1 and 0, and any number can be represented in binary. Inside the computer brain, the binary numbers are represented by pulses of electricity, with a pulse for 1 and no pulse for 0. It can therefore be on or off, 1 or 0. Hence, any byte's value can be represented by the eight switches, for example 00000001 represents 17 decimal.

As the system only uses two numbers, 0 and 1, it is known as binary OR counts, our normal numbering system is based on 10 numbers, 0 to 9, and is therefore known as decimal.

The location of the number counting from the right hand side provides the power of 10 by which each digit is to be multiplied. Let us take an example, decimal 1234 — (see figure 1).

The result of a binary computation is determined in exactly the same manner except that the location of the digit counting from the right hand side determines the power of 2 by which each number is to be multiplied. Let's take a look at a binary number and examine how it breaks down into decimal — (see figure 2).

If the above makes sense to you we are now in a position to return to the original discussion of switching these various bits in the byte.

1	2	2	4	Decimal
3	2	1	0	Location

$$\begin{array}{rcl}
 1 \times 10^3 & + & 2 \times 10^2 & + & 2 \times 10^1 & + & 4 \times 10^0 & = & 1224 & \text{Power 10} \\
 1000 & + & 200 & + & 20 & + & 4 & = & 1224 & \text{Result}
 \end{array}$$

Figure one — An aid to computation example

1	1	0	1	0	1	1	0	Binary							
7	6	5	4	3	2	1	0	Location							
<hr/>															
1*2 ⁷ +	1*2 ⁶ +	0*2 ⁵ +	1*2 ⁴ +	0*2 ³ +	1*2 ² +	1*2 ¹ +	0*2 ⁰	=214 Power							
128	+	64	+	0	+	16	+	0	+	4	+	2	+	0	=214 Result

Figure Two — Binary to decimal translation

Why should we want to do that? Well, each of these individual bits within a byte actually acts as a switch in its own right, and various combinations switch on or off the special functions previously mentioned. For instance, take a look at address 3A773 in the Programmer's Reference Guide. The upper 4 bits of this address control the location of the access memory which can be moved to any one of 13 different locations plus the one that is automatically default to go powering up the bit. It thus is not complicated enough, bits 1, 2 and 3 control the location of the character memory.

Bits are labelled from right to left in accordance with their mathematical power as in the table, in other words bit 7 is the bit 4 of a byte or address to 1, that is to have it on, you can FORCE the byte with decimal 64 (2 to the fourth power.) This FORCE does the whole byte and operates it with a 16, or in binary, 00000000.

The problem is that practically all of the bytes in the 64 byte data a variety of operations as we have seen with 3A773, and in many instances you will want to be able to switch on or off a specific bit without affecting any of the other bits. Obviously it will not be possible to do this by FORCING a single decimal number. However this can be carried out by using our OR and AND commands discussed right back at the introduction to this article.

Bits and bytes

The OR statement in keyword commands sets individual bit of the original byte and compares it with the corresponding bit of the OR byte. If one OR the other of the bits is on, that is a 1, then the resulting byte will be given a 1 in that specific bit. If neither of the bits is on, the resulting specific bit will be a 0. Therefore, if we wished to change the 4 to a 1 without changing any of the other bit settings within a particular byte,

we should FORCE 3273, (PREF 31073 OR 34)

The AND keyword behaves in a similar manner to the OR, and examines each individual bit of each byte and compares it to the corresponding bit of the AND byte. In this case it sets the bit on only if both the first bit and the second bit are 1's.

Let's take the original byte as 00011011 or decimal 19.

Original address 00011011 = 19

AND with 35 11000010 = 26

Resulting byte 00000010 = 2

Therefore ANDing 19 with 26 decimally 0,1,1 and 4. This would be written as FORCE30732,(PREF31073)ANDING.

The information as to which bit should be switched to affect different action is given in the Programmer's Reference Guide, and armed with the means to carry out these operations you will find the Commodore 64 to be a very versatile and powerful machine. ■

3D COMPUTERS

THE HOME COMPUTER SPECIALISTS

with more branches than any other Commodore specialist dealer we offer

CMS STOP SHOPPING
for you



CMS IS your local branch for friendly advice and service



See a complete display of hardware and software to build up your 64 CMS system

SOFTWARE

All the best software from the top U.K. and U.S.A. software houses eg

LLANASOFT
DATAISOFT
EPYX
INFOCOM
RABBIT
INTERCEPTOR
SUPERSOFT
ON LINE
ANROG
BROOKSOUND

PERIPHERALS

DISCS
PRINTERS
JOYSTICKS
MONITORS B&W/
COLOUR
LIGHTPENS
CIN CASSETTE DECKS

LARGE RANGE OF BOOKS
COMMERCIAL CASSETTES &
PRINTER PAPER ALONG WITH
MUCH MORE

Free Parking at all branches

TOLWORTH

220 Talworth Road South
Tolworth, Surrey
Surrey KT8 9BB
Tel 01 327 4217

SUTTON

35 Station Road
Sutton, Surrey
Surrey SM3 6BB
Tel 01 842 2534

SALING

114 Queensbury Avenue
Saling, London NE5 4AB
Tel 01 852 5855

RICKMANSWORTH

Crystalline Works
The Green, Coaley Green
Rickmansworth
Herts. WD3 3AJ
Tel 0823 776280

REMBURY

260 Blenheim Road
Rembry
Derby DE11 4 2PH
Tel 0533 30047

LUTON

1 Manor Road
Caddington Luton
Bedg. LU1 4BB
Tel 05251 45505

COMMODORE SOFTWARE FILE

Solitaire

Andrew Shovel of North sends this program for the unimproved *Vic 20*.

IN THIS version of the popular game the pips are displayed as solid blue circles, and spaces as empty blue circles. When a pip is pushed up the hole it occupied becomes an empty blue square.

To move around the board use Q for up,

A for down, < for left and > for right. Push up pips using I and on down using J. The object of the game is to remove all the pips from the board by jumping over them as in draughts — and in this version it's impossible to cheat.

```
50 R=30400 R1=7680 R2=30519 R3=7799 I=81 J1=07 B3=285 PRINT "I" P1=197
60 FORY=0T010 FORX=2T04 GOSUB1000 NEXTX NEXTY
70 FORY=50T050 FORX=2T04 GOSUB1000 NEXTX NEXTY
80 FORY=110T0120 FORX=2T03 GOSUB1000 NEXTX NEXTY POKER2.5:POKER3.5I=Y=0
90 K=PEEK(P1) DR=22*(K=48)+(K=29)=22*(K=17)-(K=37)=01*(K=41)-87*(K=42)
100 IFDR=01ORDR=07THENGOSUB300 GOTO300
110 IFDR=22OR22OR10R=1THENGOSUB200 GOTO300
120 GOTO300
200 L1=R2:POKE L1.6 R2=R2+DR R3=R3+DR POKER2.5 RETURN
300 IFDR=01ANDPEEK(R3)=0ANDY=0THENH1=R2 H1=R3 POKER3.5B3=Y+1 RETURN
305 IFDR=01THENRETURN
310 IFDR<07ORPEEK(R3)>0:GOTO310Y<1THENGOTO300
312 K=R2 H1=R3 DR=(H1+H3)/2 IFDR=0THENPOKER0.5 Y=0 RETURN
313 IFPEEK(BE)>0:GOTO310Y<1THENRETURN
314 POKEH1.51 POKER5.5 POKED5.51
315 IFY=1THENY=0 RETURN
320 IFDR=07THENRETURN
330 IFY<1THENRETURN
350 IFY<1THENRETURN
352 IFPEEK(R3)>0:GOTO310Y<1THENPOKEH1.5 Y=0 RETURN
500 GETR: IFR=R""THENG00
1000 POKER+22*(X+Y.6 POKER1+22*(X+Y.5 RETURN
```

Sea Copter

The game for the 64 comes from Simon Peng of Chesham, London.

IN SEA COPTER your task is to land on an oil rig in the height of a storm. Your life is at risk, and you must rely on flashes of lightning to see the landing pad! The wind buffets you as you hover, and you must counter gravity by pressing 'Y' to lift. 'A' moves left, 'D' moves right.

On the right of the screen are your

instruments. Watch out for wind speed. Fuel and descent rate, which must be lower than 3 miles per hour.

The program must be run twice for the second effects to be heard.

Program notes

Installation 6-4
Set up program 3-10
Update screen 08-01
Lightning timing 21-01
Read keyboard 36-10
Update speed position 46-00
Cruel handling 100-000

Landings handling 500-640

Note responses for landing 800-890
Score data 9000-9000

Variables

V Pointer to display chip locations
CD Differences between values and screen
T Lightning timer
X Sprites X-coords
Y Sprites Y-coords
D Wind direction
PE Sprites collision flags
I Fuel left
Q Descent rate

```
0 PRINT "I" POKER3200.0 POKER3201.0 Y=53240 CD=54372 POKER3420.10 POKER34276.0
1 POKER34276.125 POKER34276.240 RER ##### COPTER BY SIMON PENG###
2 POKER34276.3 T=0 K=25+INT(RND(1)*128) Y=55 D=INT(RND(1)*85)+2)/2
3 F=10 POKER+21.3 POKER2040.13 POKERV+35.1 POKER2041.14 POKERV+40.4 POKERV+20.3
4 POKERV+37.5 POKERV+30.7 POKER10T0100 READ0 POKER1+032.0 NEXT
5 PRINT "#####" "#####" "#####" "#####" "#####" "#####" "#####" "#####"
6 PRINT "#####" "#####" "#####" "#####" "#####" "#####" "#####" "#####"
7 PRINT "#####" "#####" "#####" "#####" "#####" "#####" "#####" "#####"
8 POKER1+5000T05000 POKER1.5 POKER1+00.100 NEXT FORI=00000T050020 POKER1.5
9 POKER1+00.100 NEXT POKERV/X POKERV+2.K+24 POKERV+1.Y POKERV+3.Y PE=PEEK(P1+31)
10 PRINT "#####" "#####" "#####" "#####" "#####" "#####" "#####" "#####"
```

```

11 PRINT "*****"
12 PRINT "*****"
13 PRINT "*****"
14 PRINT "*****"
15 PRINT "*****"
16 PRINT "*****"
17 PRINT "*****"
18 PRINT "*****"
19 PRINT "*****"
20 PRINT "*****"
21 PRINT "*****"
22 PRINT "*****"
23 PRINT "*****"
24 PRINT "*****"
25 PRINT "*****"
26 PRINT "*****"
27 PRINT "*****"
28 PRINT "*****"
29 PRINT "*****"
30 PRINT "*****"
31 PRINT "*****"
32 PRINT "*****"
33 PRINT "*****"
34 PRINT "*****"
35 PRINT "*****"
36 PRINT "*****"
37 PRINT "*****"
38 PRINT "*****"
39 PRINT "*****"
40 PRINT "*****"
41 PRINT "*****"
42 PRINT "*****"
43 PRINT "*****"
44 PRINT "*****"
45 PRINT "*****"
46 PRINT "*****"
47 PRINT "*****"
48 PRINT "*****"
49 PRINT "*****"
50 PRINT "*****"
51 PRINT "*****"
52 PRINT "*****"
53 PRINT "*****"
54 PRINT "*****"
55 PRINT "*****"
56 PRINT "*****"
57 PRINT "*****"
58 PRINT "*****"
59 PRINT "*****"
60 PRINT "*****"
61 PRINT "*****"
62 PRINT "*****"
63 PRINT "*****"
64 PRINT "*****"
65 PRINT "*****"
66 PRINT "*****"
67 PRINT "*****"
68 PRINT "*****"
69 PRINT "*****"
70 PRINT "*****"
71 PRINT "*****"
72 PRINT "*****"
73 PRINT "*****"
74 PRINT "*****"
75 PRINT "*****"
76 PRINT "*****"
77 PRINT "*****"
78 PRINT "*****"
79 PRINT "*****"
80 PRINT "*****"
81 PRINT "*****"
82 PRINT "*****"
83 PRINT "*****"
84 PRINT "*****"
85 PRINT "*****"
86 PRINT "*****"
87 PRINT "*****"
88 PRINT "*****"
89 PRINT "*****"
90 PRINT "*****"
91 PRINT "*****"
92 PRINT "*****"
93 PRINT "*****"
94 PRINT "*****"
95 PRINT "*****"
96 PRINT "*****"
97 PRINT "*****"
98 PRINT "*****"
99 PRINT "*****"
100 PRINT "*****"

```

For work or play Voltmace has the answer!



Made in England

For play: The delta 3c joystick is idealised for the more sophisticated user. A lightweight unit designed to be held and operated by the fingertips of the other hand. The joystick side switches control be activated by excess pressure on the joystick and the five buttons (three of them) have been tested for millions of operations.

For work: The datapad 16c is a slim, step-free travel keypad for the Commodore range plugs into the two control ports. Complete with a cassette program to define the key characters, an operation just like on the "built-in" keyboard keypad.

DATAPAD 16c £29.95
DELTA 3c JOYSTICK £19.95
Prices include VAT and P&P

Voltmace Limited
Park Drive
Bosdock
Herts
SG7 8PW
Telephone (0452) 874210

Voltmace datapad 16c & delta 3c

Callen welcome at the factory—Monday to Friday

Hard Facts on 64 Floppy Disks

The Commodore 64 Disk Companion is your authoritative guide to all the potential of the 1541 disk drive.

If you have a new disk to buy, a Commodore 1541, then make sure you've this book. The Commodore 64 Disk Companion.

It's the comprehensive, understandable guide to the hardware. It explains the internal operation. And it includes programs for storage, recovery, data protection, and file management.

The Commodore 64 Disk Companion is at your book shop or computer dealer now. Get the facts now.



Please send me the Commodore 64 Disk Companion at £2.95. I'll be happy to pay it.

- ☐ I enclose a cheque for £..... payable to Sunshine Books
- ☐ I enclose a postal order for £..... payable to Sunshine Books
- ☐ Please charge my Visa Access card No.

valid from to my name and

Address

Send to: Sunshine Books,
12150 Little Newport Street, London WC2E 8LT

Look out for the Sunshine range on MFI, Black's, House of Martin, other leading retail chains and all good bookshops. Dealer enquiries: 01 437 4343



Fruits

Please designate the top corresponding Mr. or
 woman from South America as follows:

Hardborough, Leamington
FIELD MACHINE: displays a one-armed bandit on the right of the screen. On the left is a list of winning lines. Score is displayed at top right. Full instructions are given at the start. Instructions, messages, advice, and

should enter first. On running, the part of the program will determine, as after typing in the two parts, you should use it all before anyone.

The system has to work to pull the female back in. I said I had the code.

[illegible]

**FUN TO
LEARN**



ENDNOTES

It's Magic

the Fun to Learn series

These courses, written and tested in syllabi, are the first in a comprehensive series, aimed to comply with spectrum of ages and abilities.

16.00 - 16.30: Lunch break

Fun to Learn (FEC 8, Region 32 and CBM ed).
Education for 4-12 year olds. Many drives and includes
space program, counting, money, ophthalmology and
calculation.

Monster Maths (RBC 8, Dragon 12 and CEM 44). Extending the 4-14 year olds. Maths games with 5 levels of difficulty. Covers area, perimeter, mass, volume, time, money, arithmetic skills and logical thinking.

Available now from all good stations or direct from us by sending cheque/PO or by phoning through. Delivery times as shown are:

SHARDS

SHADES SOFTWARE

Sales G, Ropcraft House, Linton Road, Barking, Essex. Tel. 01-89 7000 (3 lines)

MAILSHOT 64

COMMITTEE ON STAFF

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

ISSN 0013-7944 is a complete ISO code for use with all management systems that provide the clear link of a complete address, telephone, and fax, as a full ISO code system. For more information on this code, please visit the ISO website at <http://www.iso.org>.

- [illegible]

- Fully compatible with the popular VHS-1118, 11205, 10204 printers or other equivalent 10203 serial graphics controllers.
- Parallel drivers by HP, IBM or i Compaq are available.
- Package includes 10203 Stationery and Data type for word processing.

THE IDEAL TOOL IN THE FURNISHING OF HOSPITALS, HOMES AND GROUPS CALLS SOCIETIES AND AT HOME

1. *Journal of Management Education*, 2000, 24(1), 1-10.
 2. *Journal of Management Education*, 2000, 24(1), 11-20.

Let μ be the measure on \mathbb{R}^n defined by

WILL be marketing through its larger businesses of stocks and all a

Also immediately following the presentation of the stimulus, the

RAD SYSTEMS (dept CHD 17 Devonshire Hall
Lane, London NE7 8LJ).

Telefonische Beratung: im Fachbereich Marketing Manager an
029 9073 53 100

WAS A LOWEST-PRIORITIZED CATEGORY

PRINTERLAND™

ORDERED TODAY - DELIVERED TOMORROW

SEIKOSHA GP 50	\$130.00
SEIKOSHA GP100	\$150.00
EPSON 800 80	\$189.95
EPSON 800 80 F/T	\$214.00
EPSON 80100	\$219.00
EPSON FX 80	\$217.00
EPSON FX800	\$295.00

CLANCON FROM US	8575 00
-----------------	---------

[illegible]

JUN 8100	6244.00
BROTHER H815	6244.00
EPSON 60100	6244.00

WE SPECIALISE
YOU BENEFIT

**DRAGON PRINTER CABLES
AND ACCESSORIES IN STOCK
VARIOUS COMMODORE PRINTER
INTERFACES IN STOCK**

Educational, Government, & Non-Profit Orders: Write to: **McGraw-Hill, Inc., 1221 Avenue of the Americas, New York, NY 10020-1095.** Please allow 4-6 weeks for delivery. **Foreign Orders:** Write to: **McGraw-Hill International Book Co., 32 Avenue du Port, 1000 Brussels, Belgium.**

1000

[illegible]

Write your own machine code adventures

Without any knowledge of machine code whatsoever

AVAILABLE
NOW

THE QUILL FOR THE COMMODORE 64



AVAILABLE
NOW

Disk Version £19.95
Cassette £14.95

THE QUILL is a major new utility program in machine code which allows even the novice programmer to produce high-speed machine code adventures of superior quality to many available in the market without any knowledge of machine code whatsoever.

Using a menu adventure system you may create well over one hundred, distinctive stories and connect scenes between them. You may draw all scenes with objects and problems of your choice. Plotting around your adventure you may also add experience with any scenes with the greatest of ease. A pure textual adventure may be saved to tape for later completion. When you have done so **THE QUILL** will allow you to produce a copy of your adventure which will run independently of the main **QUILL** software, so that you may give copies away to your friends.

THE QUILL is provided with a detailed manual manual which covers every aspect of its use in writing adventures.

Available now from good computer shops nationwide, or direct from us by post or 24hr telephax

Dealers please note: This product is available from the following wholesalers:

GILSOFT
24 Matthews Road
Bury
Greater Cheshire
CH4 4JH
05444 73737

SEE DEALER FOR
PCs
CENTERSOFT
LENDRE SOFT
BRAND DISTRIBUTION
BEE COMPUTER GAMES
CHICHESTER AND SOFT WILLIAMS

TURN YOUR COMMODORE 64 INTO A PROFESSIONAL MICROCOMPUTER



FIELDMASTER high quality programs are for the serious user of the home computer.

The very latest programming techniques have been used to create clear, easy to use software that must be the finest value available.

We have a program for all your needs. Powerful spreadsheet, full function 80 column word processor, versatile card index database, accounts management, and even a logo & poster printer.

For applications in small business, education, the professions, industry and the home.

Prices from £29.95 to £89.95 via VAT tape and disk. From your local computer shop or direct from us by our fast mail order service.

Answer Everywhere enquiries.

For a FREE copy of our software guide, entitled with program information, call write or telephone.

(fieldmaster)

Fieldmaster Software Company

Dept CD 107, The Wood Park Road, Boreham, Essex SA6 6BB. Tel. 0206 378800. Fax. 0206 378801. Telex. 940000. Cable. 940000. Boreham. Essex. UK.

MORE
COPIES
WANTED?
INTERESTED?
Ask For
Details

• SOPHISTICATED GAMES FOR VIC 20/COMM 64

VIC-16 CRICKET Realistic game of cricket with over 1000 high up and comprehensive stats, full commentary and all the latest rules of cricket.

COMMODORE 64 £19.95
VIC 20 £14.95

LEAGUE SOCCER League style game for 2-24 players with full league tables, season commentary, realistic goals, referees, leagues, etc.

COMMODORE 64 £19.95
VIC 20 £14.95

WINDSURFER 10 players have fun surfing on waves at Windy Myster.

COMMODORE 64 £19.95
VIC 20 £14.95

BOF OF THE POPE Easy to learn game about the Pope.

COMMODORE 64 £19.95
VIC 20 £14.95

ELECTION NIGHT SPECIAL Easy to learn game about the 1987 General Election.

COMMODORE 64 £19.95
VIC 20 £14.95

PART 4 Five games to finish the package of your choice.

COMMODORE 64 £19.95
VIC 20 £14.95

"REB" Adults Only. Easy to learn game about the 1987 General Election.

COMMODORE 64 £19.95
VIC 20 £14.95

NEW VERSION AVAILABLE FOR ALL GAMES - £19.95 each. All prices include VAT and delivery.

COMMODORE 64 DISK WHICH ARE AVAILABLE ON REQUEST. PLEASE WRITE OR PHONE FOR DETAILS OF OUR FULL RANGE.

SOPHISTICATED GAMES

Dept CD 20, The Wood Park Road, Boreham, Essex SA6 6BB.

Tel. 0206 378800

Address

Chris Payne of St Albans' wrote this program for the 88.

ADDRESS is a computerised version of the

"little black book." It keeps track of names, addresses and phone numbers with the option to save or load addresses.

It also has a useful feature which enables you to find an address without going through the whole list.

Options include ENTER ADDRESS, INCREASE, DECREASE, HOME NUMBER, STREET,

TOWN, COUNTY, POSTCODE, PHONE NUMBER, VIEW ADDRESSES, which shows the whole list, and FIND ADDRESS, which finds an address given a surname. There are also LOAD and SAVE options.

The program can be adapted for the Vic by changing the PEEKs in line 28 which controls the screen output.

```

10 DIM#(2000),A$(2000),B$(2000),C$(2000),D$(2000),E$(2000),F$(2000),G$(2000)
20 FORC=2000-8-FOKE32081:0 FOK=44:1 REM###ADDRESS BOOK REVISED###
30 PRINT"##### CHRIS PAYNE'S"
40 PRINT"##### ADDRESS BOOK"
50 PRINT"##### REVISED EDITION"
60 PRINT"##### 8-84 C. PAYNE"
70 PRINT"ADDRESS ANY KEY TO CONTINUE."
80 GET#A:IF#A=""THEN400
90 PRINT"#####
100 PRINT"##### 1) ENTER ADDRESSES"
110 PRINT"##### 2) VIEW ADDRESSES"
120 PRINT"##### 3) FIND ADDRESS"
130 PRINT"##### 4) SAVE ADDRESSES"
140 PRINT"##### 5) LOAD ADDRESSES"
150 PRINT"##### 6) SELECT NUMBER 3"
160 GET#A:IF#A=""THEN400
170 IF#A="5"THEN#A=5 GOTO200
180 J#VAL#(X):IF#X<0OR#X>5THEN160
190 B$(X)=A$THEN160
200 GOTO202:1,370,380,390,400
210 #=#+1
220 PRINT"ADDRESS NO. ",#
230 INPUT"SURNAME OF PERSON ",B$(X)
240 INPUT"NAME ",B$(X)
250 INPUT"NO. OF HOUSE-STREET ",B$(X),C$(X)
260 INPUT"TOWN ",D$(X)
270 INPUT"COUNTY ",E$(X)
280 INPUT"POSTCODE ",F$(X)
290 INPUT"TELE. NO. ",G$(X)
300 PRINT"NO. ",#
310 GET#A:IF#A=""THEN410
320 IF#A="H"THEN400
330 PRINT"MORE?"
340 GET#A:IF#A=""THEN340
350 IF#A="Y"AND#C=300THEN#C=#+1 GOTO220
360 GOTO360
370 FOR#=#+1TO#
380 PRINT"##### B$(#), "
390 PRINT"##### B$(#)
400 PRINT"##### B$(#), ",C$(#)
410 PRINT"##### D$(#)
420 PRINT"##### E$(#)
430 PRINT"##### F$(#)
440 PRINT"##### G$(#)
450 PRINT"##### ANY KEY."
460 GET#A:IF#A=""THEN460
470 #=#+1THEN#=# GOTO360
480 NEXT
490 GOTO360
500 #=# INPUT"ENTER SURNAME OF PERSON ",#
510 PRINT"##### B$(#), "
520 IF#C<#+1THEN#C=#+1
530 NEXT
540 IF#D=0THENPRINT"##### SURNAME ",#,"...NOT FOUND..." FOR#=#+1TO1000 NEXT GOTO360

```

```

550 INPUT"ENTER ONE OF THESE NUMBERS ".X:POKE0,GOTO390
560 PRINT"DATA TAPE READY?"
570 GET#1:IF#="":THENG70
580 IF#<>"":THENH70
590 OPEN#1,1,"ADDRESS"
600 PRINT#1,B
610 FORK=1TO8
620 PRINT#1,B&C0:PRINT#1,B&C1:PRINT#1,B&C2:PRINT#1,B&C3:PRINT#1,B&C4:PRINT#1,B&C5
630 PRINT#1,B&C6:PRINT#1,B&C7:PRINT#1,B&C8:PRINT#1,B&C9:NEXT CLOSE#1
640 GOTO390
650 PRINT"DATA TAPE READY?"
660 GET#1:IF#="":THENH60
670 IF#<>"":THENH60
680 OPEN#1,1,"ADDRESS"
690 INPUT#1,A
700 FORK=1TO8
710 INPUT#1,B&C0:INPUT#1,B&C1:INPUT#1,B&C2:INPUT#1,B&C3:INPUT#1,B&C4:INPUT#1,B&C5
720 INPUT#1,B&C6:INPUT#1,B&C7:INPUT#1,B&C8:INPUT#1,B&C9:NEXT CLOSE#1
730 GOTO390

```

Mines

From Graham of Muckwell

MINES is a very simple game, the object being to clear up as many mines as you can in forty seconds. At the end of this time the remaining mines will explode. You score

five points for each mine and twenty-five points for each field you clear.

2 = Left, 3 = Right, 4 = Up, and, -
Down 0 = mine, * = booty-lagged mine.

This listing for the unexpanded file is by

```

1 REMHINEFIELD
2 PRINT"#####HIT ANY KEY" POKE36879,0
3 GET#1
4 IF#="":THEN#1
15 X=10:Y=7:Z2 SC=0 NO=0
20 B=7:CI=36879:SI=36876:S4=36877:VO=36878
30 TI#="#####T"
40 POKECI,0
50 POKEVO,15
60 PRINT"CN"
65 POKE(X+Y),81
67 FORK=1TO9
68 POKE7688+INT(RND(1)*500),42
69 NEXTK
70 FORL=1TO8
80 POKE7688+INT(RND(1)*500),87
85 IFPEEK(X+Y)=87:TI#&Z2&L
90 NEXTL
110 GET#1
120 IF#<1:THEN#10
130 PRINT"#####T"
135 PRINT"SCORE=";SC
160 IFTI#="#####T"THENH300
170 IF#="":THEN#1
210 POKE(X+Y),32
220 IF#="2":THEN#X-1
230 IF#="X":THEN#X+1
240 IF#="L":THEN#Y-22
250 IF#="":THEN#Y+22
255 IFPEEK(X+Y)=42:THENH300
260 IFPEEK(X+Y)=87:THENH300
270 POKE36886,220
280 SC=SC+5
290 S=S-1
295 POKE36876,B
300 IF#<1:THENH300
310 PRINT"#####FIELD CLEARED" NO=NO+1:POKE#1,220

```



HOVER BOVVER, REVENGE
AND NOW

SHEEP IN SPACE



llamasoft

MARTINOWSKI, MANNING, JOY, THOMPSON

SL

THE LATEST CBM 64 WORK BY JEFF MINTER AVAILABLE FROM LLAMASOFT

LLAMASOFT SOFTWARE, 48 BUCKLEY ROAD, TILFORD, SURREY, ENGLAND

ANIROG

House Of
Usher

ICE
HUNTER

**3 NEW
TURBO 64
GAMES
£6.95
EACH**

House of Usher

Dare you enter the House of Usher? Behind each locked door of this new code adventure a different style of morbid action awaits you.

PETCH

Petch

The wondrous penguin is engaged in a desperate search for diamonds hidden in a maze of ice cubes, crossed and chased by his evil master, Snowball and Snowdrift. His chance of survival lies in his keen sense of skill with two player option.

Ice Hunter

Ice Hunter seeks special ice blocks to build an igloo unaffected by the angry sun. He has found the source of the blocks in a remote level cavern. But can he collect the giant icebergs — the dragons — two lions and various birds and float the blocks down the river to construct his dream home? Six levels and two player option.

Also available on Disk at £9.95

TRADE ENDOWMENT ANIROG SOFTWARE LTD 28 WEST HILL DARTFORD KENT (0322) 52513 8
MAIL ORDER 8 HIGH STREET HOPLEY SURREY 24 HOUR CREDIT CARD SALES HOPLEY (02934) 6080
PAYMENT BY CHEQUE P.O. ACCESS/VISA 50p POSTAGE & PACKAGING £2.90 OVERSEAS

```

320 IFH0=1THENB=5:SC=SC+25
330 IFH0=2THENB=15:SC=SC+25
350 POKE63,0
360 FORT=1T0600:HEXTT
370 GOTO40
380 IFYC/600THENY=Y+22
390 IFY0164THENY=Y+22
420 POKE(X*Y),B
430 GOTO110
500 POKE54,220
510 POKEC1,9
520 FORL=1ST00STEP-1
530 POKEV0,L
540 FORH=1T0300
550 HEXTM
560 HEXTL
580 POKE54,0
590 POKEV0,0
595 PRINT"J"
596 IFSC<NSTHENB00
597 H0=SC
598 PRINT"*****HELL, SOME A NEW HIGH SCORE!",H0:SC=0
599 GOTO605
600 PRINT"*****YOU SCORED ",SC
605 INPUT"*****PHOTHER GAME Y/N",H0
610 IFH0="Y"THEN1
670 PRINT"J"
680 END

```

Meteors

A program for the unscrupulous Fly 20
from Andrew Lums of Newcastle

IN METEOR ATTACK, you are on a ship
down on the left hand side of the screen.
You can move up and down, and have to
shoot the meteors which fly at you from
right to left. If you give just you, you lose a
life.

Send you more. At last did you only have
one life, and the screen score lower. Your
remaining lives are indicated on the top
right hand corner of the screen and your
score is the top left.

Program notes

15-40: Initializing
40: Set up lives and colours
50: Set variables
60: Randomize the screen
100-140: Shooting meteors

210-250

on fire meteors
Checks for score or if screen
has passed

300-320

Checks if you have run out of
lives

400-420

Fire routines

500-540

Randomize meteors

600-650

Increases score if you hit meteor
explodes

700-750

Input shell level

800-850

Checks for whether game is
over

The number of lives depends on the skill

850-900

Checks for key input to move

1000-1150

Initialization

```

10 G=7990: C=98629: B=7722
15 POKE34079,40: POKE36070,15
20 PRINT"J": POKE650,120
30 GOSUB1000
40 GOSUB700
45 FORR=1T08L: POKE7650+R,62: POKE30415+R,0: HEXTM
50 X=1: Y=1: B0=1: D0=0
60 GOTO500
70 POKEJFO=X+22*Y,7: POKEB=X+22*Y,90
80 POKEG,62: POKEC,0
90 FORT=1T08L:30: HEXTT
100 POKEB=X+22*Y,32
110 PRINT"*****SCORE =",SC
120 PRINT"*****"
140 POKE3,32
150 GETM0
160 IFG=7746THENL00
170 IFH0="R"THENG=0-22: C=C-22
180 IFQ=8164THENQ00
190 IFH0="2"THENG=0+22: C=C+22
200 IFH0="." THENGOTO400

```

Continued on page 22



Mastercode Assembler

for the Commodore 64

Full Commodore 64 Assembler/Disassembler



£14.95

Mastercode is a substantial and complex program of use to anyone interested in writing machine code on the Commodore 64. Its features include:

- ☐ Machinecode monitor
- ☐ File Editor
- ☐ Disassembler
- ☐ Assembler

Mastercode is a full two pass assembler. It accepts labels, variables and equations within assembly language programs. It is possible to store programs anywhere in memory, even in parts occupied by the Assembler. Programs can be saved to either tape or disc.

The Machine Code Monitor includes:

- OUTPUT OF MEMORY TO SCREEN OR PRINTER ■ MODIFICATION OF MEMORY ■ DELETION OF MACHINE CODE PROGRAMS ■ SAVING OF MACHINE CODE FILES ON TAPE OR DISC
- LOADING OF MACHINE CODE FILES FROM TAPE OR DISC ■ STEP BY STEP TRACKING OF THE DELETION OF A MACHINE CODE PROGRAM INCLUDING DISPLAY OF REGISTER CONTENTS

The Disassembler will translate into assembly language the contents of one area of memory, whether the 64K ROM or user program. Output files can be sent either to the screen or a printer.

The File Editor includes:

- ENTRY OF NUMBERED LINES OF ASSEMBLY LANGUAGE INSTRUCTIONS ■ LISTING INDIVIDUALLY OR IN BLOCKS OF PREVIOUSLY ENTERED LINES ■ DELETION INDIVIDUALLY OR IN BLOCKS OF EXISTING LINES ■ RENUMBERING OF EXISTING LINES ■ SAVING OF ASSEMBLY LANGUAGE FILES TO TAPE OR DISC ■ LOADING OF ASSEMBLY LANGUAGE FILES FROM TAPE OR DISC ■ ADDITION OF A BLOCK OF MEMORY SPECIFIED BY THE USER TO THE USER'S ASSEMBLY PROGRAM

The Assembler allows the translation of assembly language programs into machine code with full error checking, repeating and a range of assembler directives.

LOOK OUT FOR THE SUNSHINE RANGE IN WH. SMITH'S, BOOTS, JOHN MENN'S, OTHER LEADING RETAIL CHAINS AND THROUGH OUR NATIONAL NETWORK OF BOOK SHOPS AND SPECIALIST STORES.

Please send me _____
a copy of the 100% full Mastercode Assembler
at £14.95 plus VAT. I enclose/cheque/credit order for £ _____
(payable to Sunshine, 101/103 Little Newport Street, London WC2R 3PG)
Or telephone your order through Access/Disaccessed on 01 457 4343

Name _____

Address _____

Signature _____

```

210 X=X+DX
220 IFX=28THEND300
230 IF(B-X+22*Y)=7782THENDX=X+DX
240 POKE36876,B
250 GOTO78
300 P=P+1
310 IFP=9LTHENGOTO300
315 POKE3695+P,32
320 GOTO50
400 FORI=1TO18
410 POKE9+I,45
420 IF(B-X+22*Y)=(9+I)THENGOTO600
430 POKE9+I,32
440 NEXTI
450 GOTO210
500 R=INT(1+17*RAND(8))
510 R=R#22
520 B=7722+R
530 UFO=38442+R
540 GOTO78
600 POKE36877,220 FORL=1STO1STEP=1
610 POKE36878,L POKE9+I,42 POKE9+I,43 NEXTL POKE9+I,32
620 POKE36878,B SC=SC+18
630 GOTO50
700 POKE36879,B PRINT"*****INPUT SKILL LEVEL      AKL TO 5)"
710 INPUTSL
720 IFSL>3ORSL<1THEN700
730 PRINT"?"
738 RETURN
800 PRINT"*****YOU SCORED",SC POKE36879,27 PRINT"XDO
      YOU WANT ANOTHER GO?"
810 INPUT"*****Y/N?" ,ANS
820 IFANS="N"ORANS="Y"THEN800
830 IFANS="Y"THENRUN

```

Hangman

Here's the game from *Amiga's Island of
Drak* — one using the Super Expander

HANGMAN is a simple version of the old
game. To play, the word or words are
entered and RETURN pressed. The com-
puter then displays a dash for each letter.
When entering more than one word the
words should be separated by a division (/)
sign.

To guess letters just press the appropriate
key. If correct the display will show the
letter in place; if not another guess will be
added to the hanging man.

Press * to display the full word and the
computer will display an invitation to play
the game again.

```

100 CLR PRINT"?" INPUTW0$ PRINT"?" LB=LEN(W0$) DIMRR(LE),BL$(LE) B=-1
110 FORX=1TOLE RRR(X)=MID$(W0$,X,1) NEXT
120 FORX=1TOLE IFRR(X)="" THENBL$(X)=RR(X) NEXT
121 BL$(X)="" NEXT GOSUB200
130 C=0 GET#4: IF#4="" THEN140
141 IF#4="*" THENPRINT"*****" ,W0$ GOTO260
144 FORX=1TOLE IF#4=RR(X) THENBL$(X)=RR(X)
145 NEXTX IFC=1 THENGOSUB220
146 IFC=8 THENGOSUB280
150 GOTO140
200 PRINT"?" TR$(222) FORX=1TOLE PRINTBL$(X) NEXTX RETURN
220 B=B+1 IFB=8 THENFORX=1TO4 POKE36553+X,2 POKE7783+X,128 NEXT
221 IFB=1 THENFORX=132TO228STEP=22 POKE36481+X,2
      POKE7681+X,118 NEXT RETURN
222 IFB=2 THENFORX=105 POKE36423+X,2 POKE7783+X,128 NEXT RETURN
223 IFB=3 THENFORX=23TO28STEP=21 POKE36423+X,2 POKE7783+X,78 NEXT RETURN
224 IFB=4 THENPOKE36458,2 POKE7738,66 RETURN
225 IFB=5 THENPOKE36472,2 POKE7732,87 RETURN
226 IFB=6 THENPOKE36494,2 POKE7774,182 POKE38516,2 POKE7796,182 RETURN

```

```

227 IFB=7THENPOKE38471,2:POKE7731,77:RETURN
228 IFB=8THENPOKE38473,2:POKE7733,78:RETURN
229 IFB=9THENPOKE38537,2:POKE7817,78:RETURN
230 IFB=10THENPOKE38539,2:POKE7819,77
240 PRINT"#####"
241 PRINT"#####ANOTHER GAME? Y/N"
242 GET#A:IFX#=""THEN242
243 IFX#="Y"THEN100
244 END
250 PRINT"#####CONGRATULATIONS!"
251 PRINT"#####ANOTHER GAME? Y/N"
252 GET#A:IFX#=""THEN252
253 IFX#="Y"THEN100
254 END

```

Connect 4

Andrew Stained's version of Connect 4 runs the Fox and Super Dipper.

THIS GAME uses the graphics commands of the Super Dipper because the children like the way it draws circles.

Two players take turns placing disks by entering the column number. There are

seven columns in which the disks can be placed.

When a player gets four counters in a horizontal, vertical or diagonal row, press 5 to record the winner and start a new game.

```

5 CLR PRINT"3" GRAPHICS COLOR1,3,6,0 S1#="0" S2#="0" S1#0 S2#0:C=6
10 FDIS=1708 DRA42,X#100,100TOX#100,000 NEXTX
30 FDIS=1707 DRA42,100,X#100TO000,X#100 NEXTX
40 CHA14,2,"1 2 3 4 5 6 7"
50 X1=150 X2=250 X3=350 X4=450 X5=550 X6=650 X7=750
51 Y1=650 Y6=650 Y3=650 Y4=650 Y3=650 Y2=650 Y1=650
50 CHA10,1,"BLUE" CHA10,5,51# CHA10,9,"RED" CHA10,12,52#
59 CHA15,1,"OR 5 TO RESTART"
60 CHA15,1,"COUNTER IN ROW"
61 GET#A:IFX#=""THEN51
62 IFX#="1"DRW42"7"ANDR42"5"THEN51
65 IFX#="5"THEN SCHLR GOSUB400 PRINT"3" GRAPHICS:GOTO10
70 IFX#="1"THENX#X1 Y#Y1 Y1=Y1-100 GOSUB300
80 IFX#="2"THENX#X2 Y#Y2 Y2=Y2-100 GOSUB300
90 IFX#="3"THENX#X3 Y#Y3 Y3=Y3-100 GOSUB300
100 IFX#="4"THENX#X4 Y#Y4 Y4=Y4-100 GOSUB300
110 IFX#="5"THENX#X5 Y#Y5 Y5=Y5-100 GOSUB300
120 IFX#="6"THENX#X6 Y#Y6 Y6=Y6-100 GOSUB300
125 IFX#="7"THENX#X7 Y#Y7 Y7=Y7-100 GOSUB300
130 IFC=6THEND=2 COLOR1,3,6,0
131 IFC=2THEND=6 COLOR1,3,6,0
132 C=D
133 GOTO50
380 COLOR1,3,6,0 CIRCLEC,X,Y,52,20:PRINTC,X,Y
310 RETURN
400 GRAPHICS PRINT"END NO BLUE OR RED"
405 PRINT"ENTER B OR R"
410 GET#A:IFX#="B"ANDX#="R"THEN410
415 IFX#="B"THEN51=S1+1
420 IFX#="R"THEN52=S2+1
425 S1#STR$(S1) S2#STR$(S2)
430 PRINT"END STARTS-B/R"
435 GET#A:IFX#="B"ANDX#="R"THEN435
440 IFX#="B"THEND=6 COLOR1,3,6,0 RETURN
445 IFX#="R"THEND=2 COLOR1,3,6,0 RETURN
555 SS$LIST

```

Send us your Commodore programs, including a cassette — and a printout on plain white paper, if possible. Each listing must be accompanied by a typewritten introduction describing the program and explaining how it is constructed. We pay £4.50 for each bug-free listing published. We cannot guarantee to return every program submitted, so please keep 4 copies. If you want us to return your listing you must include a stamped, addressed envelope. If you have any problems with the program, please write to the appropriate author. Software File
Commodore Hardware, 12-18 Uddle Newport Street London WC2E 8LD

CASH CONTROLLER

COMMODORE 64

HOME BUDGETING & BANKING SYSTEM

ON CBM 64 DISK AND CASSETTE

A professional style multi function Cash Controller program. In disk format you can load, and make an entry ... or update your existing records ... in just seconds. This easy to use program can handle up to 400 transactions, giving instant statements of your bank balance.

BANK ACCOUNT

- Statements on-demand from any date to date
- Holds up to 400 transactions
- Standing order facility
- All transactions can be automatically coded to allocate up to 16 Budget headings
- Search facility for any single item by description or amount

HOME BUDGETING

- 16 Budget Headings, e.g. Gas, Rates, Car, Tax - you can choose the headings

- Highlights under/over spending
- Full budget expenditure breakdown
- Budget "re-check" facility

LOAN/MORTGAGE CALCULATOR

- All you ever wanted to know but didn't like to ask Calculates
- Interest rates
 - Payback periods
 - Capital sum
 - Period of loan

• **PRINTOUT FACILITY USING STANDARD COMMODORE PRINTERS OR SENGSHA GP100VC.**

• **FULL SECURITY WITH PERSONAL PASSWORD.**

• **SAVE DATA ONTO CASSETTE OR DISK USING 1541 DRIVE.**

DISK £14.95 TAPE £9.95 (inc. P&P)

CREDIT CARD HOTLINE 06286 63531 (24 HOURS)

Please send me:

- | | |
|-------------------------------|-----------|
| _____ Autocalc 64 Disk | at £19.95 |
| _____ Autocalc 64 TAPE | at £14.95 |
| _____ Cash Controller 64 Disk | at £14.95 |
| _____ Cash Controller 64 TAPE | at £9.95 |

(Overseas orders add £3.50 P&P)

For cash Cash/Cheque/P.O. payable to Richard Shepherd Software Ltd. Or please debit my ACCESS/VISA card No.

Signature _____ ADDRESS _____

NAME _____ ADDRESS _____

AUTOCALC 64

COMMODORE 64

THE SPREADSHEET IN A CLASS OF ITS OWN

TAPE
£14.95
DISK
£19.95

- Q Which spreadsheet is suitable for accountants, engineers, scientists and home-users?
- A: Autocalc 64 is ideal for any application involving extensive manipulation of data and formulae from financial planning to market research.
- Q Which spreadsheet offers an advanced level of formula handling?
- A: Autocalc 64 copes easily with trigonometrical functions, parenthesis and boolean logic as well as totalling and averaging.
- Q Which spreadsheet accepts complex conditional statements?

A: Autocalc 64 can handle statements as complex as IF $A1 < 1,000$ OR $A1 = 10,000$ AND $A2 = 500$ THEN $B1 = 5$

- Q Which spreadsheet offers a flexible screen format?
- A: Autocalc 64 allows you to select (i) column widths from 8 to 30 characters (ii) the number of rows/columns you need (iii) up to 2,000 cells of information (iv) text or numerical entries lined up to the right or the left, or a combination.
- Q Which spreadsheet offers a choice of numerical formats?

A: Autocalc 64 gives you a choice of (i) integers (ii) floating decimal point (iii) currency (iv) any combination of these.

- Q Which spreadsheet offers a full 'replicate' facility?

A: Autocalc 64 has an advanced replication function for transferring text, data, formulae or conditional statements from any cell (or block of cells) to any other(s) without monotonous retyping. A go to facility will take the cursor instantly to any cell of your choice — saving time.

- Q Which spreadsheet is easy to use yet advanced in operation?

A: Autocalc 64 is designed to guide you — helpful error reports diagnose input or formulae errors. A full demonstration program and comprehensive instructions are included.

- Q Which spreadsheet is compatible with standard Commodore printers?

A: Autocalc 64 gives you a printout facility using any of these printers: Commodore 1515, 1525, MPS 801, 1520, MCS 801, DPs 1101, Sengsha GP100VC.

- Q Which spreadsheet is 100% machine code for fast efficient responses, and offers a choice of saving to disk using 1541 drive) or to tape using a C2N unit?

A: Autocalc 64 — as if you didn't know!

- Q Which spreadsheet sells at a realistic budget price?

A: Autocalc 64 costs just £14.95 on tape, £19.95 on disk inclusive of VAT and P&P.

- Q Where do I get one?

A: Ring us now on 06286 63531 (24 hours) to place your ACCESS or VISA card order, or complete the order form and send it to us today. (Prompt delivery promised). Autocalc 64 is available only direct from Richard Shepherd Software.

CREDIT CARD HOTLINE 06286 63531 (24 HOURS)

RICHARD SHEPHERD SOFTWARE

PO BOX 10, 11 HILARY ROAD, CHORHAM, SURREY GU9 0BB. TEL: 0436 55411

THIS ARTICLE has been written to show the using Relative files & many included in the article are a substitution for file handling, 2 general purpose routines and a program for creating Relative files

File handling is one of the most important techniques in serious micro-computer programming. Good file design and handling is a great asset in any program, whereas bad file design and handling will spoil even the best of programs. Computers usually use two types of files, Sequential and Relative, though there is a noticeable lack of information on how to use a Relative file. Sequential files are slow, and have their length limited by the amount of space memory available after loading the program. This is because a Sequential file must be read into memory before any records can be read from the file.

Relative files, on the other hand, can be used by loading only the record required into the memory. This has two advantages, the first is that in a large file the records near the end of the file can be accessed quickly without waiting for all the prior records to be read. The second advantage of Relative files is that the length of the file is generally limited by the amount of space available on the disk, not the memory available on the computer.

Relative

This will allow larger file lengths, the maximum being that the disk drive have a limit of 720 records with a maximum length of 254 characters. This limit still allows files to hold up to 170K of data. The main drawback with relative files is that the maximum record length used by us when the file is first set up, the record length cannot then be altered for that file. Relative files are formatted in the same way as Sequential files but, as stated earlier, to load and save Relative files the record number must be used to position the record in the file. The record number is usually calculated by a "loading algorithm", which is described fully in the section "Creating record number".

Before running a program which uses Relative files, the file must be already on the disk. Program 1 creates a blank file ready for use by another program. Program 1 asks for the file name, record length and maximum number of records. When calculating the record length remember to allow 1 character after every field as a separator. It is recommended that you allow a few spare characters in space for later developments in the record length cannot be changed later. For an example of calculating record lengths see page 22 of the 1100 users manual.

Sequential

When calculating the maximum number of records allow at least 5 above the estimated number in the loading algorithm, needs to have record spaces in file. The reason for these spaces will be explained in the section "Creating record number".

There are three general routines included in this article, 1) set the maximum number

PROGRAMMING

1541 files made clear

Tony Harrison-Smith explains techniques for using relative files on your 1541 disk drive

```

7 REM ***** PROGRAM 1 *****
8 :
9 REM ***** CREATE BLANK FILE *****
10 OPEN:5,8,15
20 INPUT"FILE NAME :";FM$
30 INPUT"RECORD LENGTH (MAX 254) :";RL;IF RL<1 OR
   RL>254 THEN 30
40 INPUT"MAX NO. OF RECORDS :";RM
45 PRINT(PRINT"PLEASE WAIT-CREATING FILE")
50 OPEN:2,8,2,FM$+"",L,"+CHRS(RL)
60 GOSUB 500
70 RL=INT((RM+1)/255)*255;RL=RM+1-RL
80 PRINT:15,"P"CHRS(2) CHRS(82)CHRS(11)CHRS(1)
90 PRINT:2,"END" GOSUB 600
100 CLOSE:2;CLOSE:1;PRINT"FINISHED";END
200 INPUT:15,A,B,C,D;IF A=0 OR A=50 THEN RETURN
300 PRINT A,B,C;D:STOP:RETURN

```

```

1 REM **** GENERAL ROUTINE 1 ****
2 RM = 25 : REM MAX NO. OF RECORDS

```

```

6000 REM **** GENERAL ROUTINE 2 ****
6000 :
6000 REM **** BLK, CWRG ****
6010 INPUT:15,A,B,C,D : IF A=0 OR A=50 THEN RETURN
6020 PRINT A,B,C;D : STOP : RETURN

```

```

6700 REM **** GENERAL ROUTINE 3 ****
6700 :
6800 REM **** POSITION RECORD ****
6810 RL=INT(RM/255)*255; R2=RM-RL
6820 PRINT:15,"P"CHRS(2)CHRS(82)CHRS(11)CHRS(1)
6830 RETURN

```

```

5000 REM **** SUBROUTINE 1 ****
5000 :
6000 REM **** CREATE RECORD NO. ****
6010 RM = 0: FOR I=1 TO LBN(AS)
6020 RM = RM+ASC(MID$(AS,I,1))
6030 NEXT I
6040 RM = INT(RM-(INT(RM/99)*99))+1
6050 RETURN

```

COMMODORE 64

OXFORD
PASCAL

YOUR FUTURE WITH COMPUTERS DEPENDS ON PASCAL



Oxford Computer Systems
Oxfordware Ltd
Hemel Hempstead,
Herts.
Oxford OX2 7UB England
Telephone: 0925 473700
Telex: 80167 HEM 0224

Find out

- PASCAL is the world's most popular programming language after BASIC
- PASCAL is FAST - up to 30 times the speed of BASIC

Learn why it's better

Commodore PASCAL is a COMPAQ 11/72 implementation of the popular programming language PASCAL running on the Commodore 64.

Personal Computer

With its COMPAQ extensions to PASCAL, you can programme anything you wish and still sound like a

professional

With the latest version of Oxford PASCAL, you get

- A powerful text editor for preparing PASCAL programs
- A resident compiler giving 14k of user RAM
- A powerful set of colour graphics and sound extensions to standard PASCAL

With the disk version of OXFORD PASCAL, you get

- A built-in ROM-PLUS
- A full disk to disk compiler exploiting the entire memory of the 64 for PASCAL programs

Get the best program for your money

Desktop version (resident compiler only) £14.95
Full disk compiler (RAM, ROM, ROM) £29.95
Prices are exclusive of VAT. There is also a small charge for post and packing.

CLASSIFIED

YOUR FREE OPPORTUNITY TO BUY, SELL OR SWAP

Each month, the classified columns of *Commodore Horizons* are made available to readers with something to sell, swap, buy or even give away.

The service is free, the audience is large and response to ads has proved to be good.

If you have something to advertise, then send us your entry right away. You can take up to 36 words to get your message across and as long as you're not running a business or selling anything for profit, we'll publish it in the first available issue.

Turn to pages 64 and 65 for this month's selection.

of records, it test for disk errors and to position the disk drive's read-write head to the record required.

1) — This is a rare line routine which sets RPL with the maximum number of records. This must be set as it is used to calculate record numbers.

2) — This is the standard routine for the IBM disk drive. The routine reads the error channel in line 4140. If the error flag is set to 0 (no disk error) or 90 (a second not found) then the routine returns. Any other error is reported by line 4150 and the program stopped. If the error is not critical then the program can be restarted by typing CONT (press).

3) — This routine positions the read-write head of the disk drive to the record required. The line C1400 is the current channel number. The next two C1450 are the record number where R2 is the low byte and R1 is the high byte of the record number. The line C1460 positions the read-write head at the start of the record to be the first character.

Routines

These routines are all used by the following set of subroutines and therefore must be included in any program.

Creating a record number is achieved by using a hashing algorithm. A hashing algorithm is a routine which takes a key field, for example a person's name in an address program, and converts the key field into a record number. The hashing algorithm used in subroutines 1 takes the string A5 and converts it into a record number by adding each ASCII value in the string and then dividing by the maximum number of records. The remainder plus one is the record number. The reason one is added to the remainder is that record number 0 is invalid. It can be seen that this method will cause some records to have the same record number, which is why space must be left in the file. The space in the file do not use up any significant memory on the disk, as they are read as empty records, but they do allow for an overflow on the record number.

When the following routines try to read a new record, if the record number is already taken then the system moves to the next record number until an empty record is found to save the data into. If too many records try to go in for some data in the file then the loading and saving times will increase dramatically. In this situation the file must be re-created with the maximum number of records increased or a new type of hashing algorithm.

Loading

Included in this article are two ways to load a record from a Relative file, 1) load record from a known record number and 2) load a record with a known key field.

1) — Load from a known record number is shown in subroutine 2. Before this subroutine is called the file name (FNM) and record number (RNM) must be assigned. Line 4140 sets the error flag to 0, opens the named channel and the Relative file FNM. The read-write head is positioned at the record required and the disk error

channel is checked in line 4150. Line 4160 inputs the first line of data on line 4140 checks to see if the record is empty, i.e. it holds only the character * in the disk error = 34. If the record is empty then the channels are closed, the error flag is set to 0 and the routine returns.

Assuming the record is not empty, line 4145 repositions the head at the start of the record again and line 4150 loads the record as a memory. Line 4160 checks for any disk error and then line 4170 closes the channels and returns to the main program. NOTE: Line 4110 can be altered to read your own individual record format.

2) — Load a record by key field is shown in subroutine 3. This routine is similar to subroutine 1 with the addition of line 4155 to 4245. These lines compare the first data in the record (RNM) with a known key (A5).

If A5 and RNM are not the same then the record number is increased by one in line 4240. If the record number is greater than the maximum number of records then the record number is set to one. The next record is then loaded and the process repeated until an empty record is found or a match is found between A5 and RNM. If a match is found then the record is loaded by line 4170. NOTE: Line 4170 can be altered to read your own individual format.

There are two subroutines for saving records to a file, 1) decreasing existing record i.e. by known record number and 2) save new record. As with all the subroutines in this article the file name (FNM) and record number (RNM) must be assigned prior to using these routines.

1) — Changing a known record is shown in subroutine 4. Line 4110 opens the

```

4090 REM **** SUBROUTINE 2 ****
4095 :
4100 REM **** LOAD RECORD BY NO. ****
4110 EP=0:OPEN1 5,8,15:OPEN2,8,2,RMS
4120 GOSUB 4800:GOSUB 4900
4130 INPUT#2,R25
4140 IF A=50 OR R25="*" THEN EP=1:CLOSE#2:CLOSE#1:R25="*"
4145 GOSUB 4800:GOSUB 4900
4150 INPUT#2,X15,X25,X35,X45
4160 GOSUB 4900
4170 CLOSE#2:CLOSE#15:RETURN

```

```

4190 REM **** SUBROUTINE 3 ****
4195 :
4200 REM **** LOAD RECORD BY KEY ****
4210 EP=0:OPEN1 5,8,15:OPEN2,8,2,RMS
4220 GOSUB 4800:GOSUB 4900
4230 INPUT#2,R25
4240 IF A=50 OR R25="*" THEN EP=1:CLOSE#2:CLOSE#1:RETURN
4250 IF A5=R25 THEN 4270
4260 RM=RM+1 : IF RM=RM THEN RM=1
4265 GOTO 4220
4270 GOSUB 4800:GOSUB 4900
4275 INPUT#2,X15,X25,X35,X45
4280 GOSUB 4900
4285 CLOSE#2:CLOSE#15:RETURN

```

```

4290 REM **** SUBROUTINE 4 ****
4295 :
4300 REM **** OVERWRITE RECORDS ****
4310 OPEN1 5,8,15:OPEN2,8,2,RMS
4320 GOSUB 4800:GOSUB 4900
4330 Z5="*"
4340 PRINT#2,X15,X25,X35,X45
4350 GOSUB 4900
4360 CLOSE#2:CLOSE#15:RETURN

```


Simple Simon's

2000-2001
 2001-2002
 2002-2003
 2003-2004

Try the 4000 Applications Book by Rodney Zaks, published by Sybex, which should still be available from computer operation bookshops. The design used in the 44 are of the same family and use the same instruction set.

Total
garbage

© 2000 McDonald's
Chicago, IL
McDonald's Corp. All rights reserved.

One solution is to reinitialize the program so that data is stored in [A..50] by P-Linking then P-Linking the data when required. Another is to build several strings as time, then extract what you need using `INDEX`.

The time taken for garbage collection is given by $4000k^2$ (k + 1)²/2, where k is the number of objects created.

Banks of the 64

IF USED the programmable character facility of the 801 have been frustrated by the limitations this places on memory available for the next program. Why does IE of character not reduce MK 801 to IE? I have a suspicion that the Programmer's Reference Guide is trying to help, but I can't understand what it's telling me. Can you help?
 J J Chance
 E-mail

TABLE 1b becomes your new parking your character set in the first 16K block of the disk. The 4K pointers up to this block, which is Block 0, 300000-315000. At your 4K set, parking your character set in this block then lowering the set of 16K to prevent the set from being over-written. results in the available memory in 16K-32 = 128K (8 pages) Block 3 (315000-315000) then more memory will be available. Try the following:

The program is neither slow, since it is in Basic, nor does it change with new trends at \$99.95 to \$199.95, and you can alter the running set, which the above program reports into RAM by FORKING the corresponding addresses within the above range using the format: $P = \text{P} + \text{P} \times \text{P}$ or $P = P - P \times P$ if the address in FORK, your designation of the character is required. Then $\text{PORK } P, P/P$ is the character position of the character digit measured from the start of the character set and $\text{P} = P$ is the "dit" is of that character. If you prefer to watch the characters changing then

No NEWS
is good . . .

I understand it's possible to use some machines to lump together any separate programs loaded independently into RAM. On the 486 the resident program in NEWWin loads loading another program. Is it possible to avoid this?

MACHINE CODE programs can be loaded from the 486, and the resident program is then on NEWWin. The programs must not overwrite each other unless this is needed for in case routine

As for Basic programs, by loading from within the program (called *overlays*), and providing that the called program is not larger than the calling program, then the new program will run economically and retain the variables from the old.

Of course the resulting listing will be the called program, not the original, but you can get around this by recalling the original program in the last line of the called program.

You can stop the program
from repeating the first run
by hitting a key such as F8.

$A_1 = A_2 = \emptyset$ iff $A_1 = \emptyset$ and $A_2 = \emptyset$

Basic buttons

COULDS WEPL still not begin to
measure the bottom of Furoy
above the high precipitation
historic area, we display the page
left. www.wepb.com

127 of our Programmers.
Mathewson Good: I have tried
 achieving the values of emergency
 insurance (40k), which results
 in the program apparently
 loading in the right place.
 Typing L&T produces a
 listing of the program, but
 K&W produces a STENTAN
 ERROR. I've searched the
 Clinic but have failed to find
 any explanation.
Eae Maxwell
 Washington
 Washington
 Washington

Watson Commands

I OSM & A Vnc 2.0 with a IREK Rabel pack and in "Wassers" number 1 I would like to know the best way to add and to communicate via CHARLIE, such as VNC, I.E., SCHEME (I.I., TIME, IREK, I.FOR), programmable function keys, and so on. Also it is possible to use something to make the replacement of the basic tokens by changing the memory?

The **CHANGE** routine is in **RAM**, and therefore can be changed in place in your own version of the routine, which would intercept the required keywords and direct the computer to your own subroutines to implement "SOLVER", and so on. Before changing **CHANGE**, you must double-check with **NO**, and enter the change routine with **CR**.

If you need help with a technical query or problem write to:
Jack Cohen,
Commodore Horizons,
13-15 Little Newport
Street London
WC2N 6LP

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

Frontal and lateral views of the skull of *Stenocranius* sp. n. (holotype, BMNH reg. no. 1998.10.12.1). The skull is small, with a broad, flat rostrum and a deep, narrow orbit. The snout is short and broad, with a prominent premaxilla. The orbit is large and deep, with a prominent supraorbital ridge. The skull is covered in small, rounded scales. The lateral view shows the profile of the skull, including the orbit, snout, and occiput. The frontal view shows the top of the skull, including the rostrum, orbit, and occiput.

[illegible][illegible]

Powerful nasal passages: Head has multiple air sacs to breathe in air. Air sacs enable fish, coral, animals below deep water and small animals (like parrot) passing gas line. Multiple fish breathing pass different fish air. Fully grown adults with some pollution may be seen swimming. Great value.

1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2033-2034	2034-2035	2035-2036	2036-2037	2037-2038	2038-2039	2039-2040	2040-2041	2041-2042	2042-2043	2043-2044	2044-2045	2045-2046	2046-2047	2047-2048	2048-2049	2049-2050	2050-2051	2051-2052	2052-2053	2053-2054	2054-2055	2055-2056	2056-2057	2057-2058	2058-2059	2059-2060	2060-2061	2061-2062	2062-2063	2063-2064	2064-2065	2065-2066	2066-2067	2067-2068	2068-2069	2069-2070	2070-2071	2071-2072	2072-2073	2073-2074	2074-2075	2075-2076	2076-2077	2077-2078	2078-2079	2079-2080	2080-2081	2081-2082	2082-2083	2083-2084	2084-2085	2085-2086	2086-2087	2087-2088	2088-2089	2089-2090	2090-2091	2091-2092	2092-2093	2093-2094	2094-2095	2095-2096	2096-2097	2097-2098	2098-2099	2099-2100	2100-2101	2101-2102	2102-2103	2103-2104	2104-2105	2105-2106	2106-2107	2107-2108	2108-2109	2109-2110	2110-2111	2111-2112	2112-2113	2113-2114	2114-2115	2115-2116	2116-2117	2117-2118	2118-2119	2119-2120	2120-2121	2121-2122	2122-2123	2123-2124	2124-2125	2125-2126	2126-2127	2127-2128	2128-2129	2129-2130	2130-2131	2131-2132	2132-2133	2133-2134	2134-2135	2135-2136	2136-2137	2137-2138	2138-2139	2139-2140	2140-2141	2141-2142	2142-2143	2143-2144	2144-2145	2145-2146	2146-2147	2147-2148	2148-2149	2149-2150	2150-2151	2151-2152	2152-2153	2153-2154	2154-2155	2155-2156	2156-2157	2157-2158	2158-2159	2159-2160	2160-2161	2161-2162	2162-2163	2163-2164	2164-2165	2165-2166	2166-2167	2167-2168	2168-2169	2169-2170	2170-2171	2171-2172	2172-2173	2173-2174	2174-2175	2175-2176	2176-2177	2177-2178	2178-2179	2179-2180	2180-2181	2181-2182	2182-2183	2183-2184	2184-2185	2185-2186	2186-2187	2187-2188	2188-2189	2189-2190	2190-2191	2191-2192	2192-2193	2193-2194	2194-2195	2195-2196	2196-2197	2197-2198	2198-2199	2199-2200	2200-2201	2201-2202	2202-2203	2203-2204	2204-2205	2205-2206	2206-2207	2207-2208	2208-2209	2209-2210	2210-2211	2211-2212	2212-2213	2213-2214	2214-2215	2215-2216	2216-2217	2217-2218	2218-2219	2219-2220	2220-2221	2221-2222	2222-2223	2223-2224	2224-2225	2225-2226	2226-2227	2227-2228	2228-2229	2229-2230	2230-2231	2231-2232	2232-2233	2233-2234	2234-2235	2235-2236	2236-2237	2237-2238	2238-2239	2239-2240	2240-2241	2241-2242	2242-2243	2243-2244	2244-2245	2245-2246	2246-2247	2247-2248	2248-2249	2249-2250	2250-2251	2251-2252	2252-2253	2253-2254	2254-2255	2255-2256	2256-2257	2257-2258	2258-2259	2259-2260	2260-2261	2261-2262	2262-
-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-------

CPM 3.4 (single vol) cassette £9.95
 CPM 3.4 (complete) disk £19.95
 All programs with full documentation and guarantee and more
 for your work all direct access to CPM3.4 prices include up to 1000
 points/plates. Price includes fast delivery by first class post.
 Tel: 01223 313131

© 2005 Blackwell Publishing Ltd *Journal of Internal Medicine* 258: 105–112

CONGRATULATIONS to the two teams named for the 1987-88 season: **Manly-Warringah** and **North Sydney**. **Manly** return to the water with high hopes of first place (the team finished 10th last season) and **North Sydney** will be looking to improve on their 1986 12th place finish. **Manly** will be looking to improve on their 1986 12th place finish. **North Sydney** will be looking to improve on their 1986 12th place finish.

WORKING FOR is a weekly journal to help all people understand the power of their own lives for their future. It is designed to be a guide to the future of the world.

OSCAR-2000 is Online Library Membership Management. It is an Online Membership Tracking and Renewal System. It is designed to help libraries manage their membership programs more effectively. For more information, contact: **OSCAR-2000**, 1000 University Drive, Westborough, MA 01581, USA.

[illegible][illegible]

YAC 20 SOFTWARE For sale Computer
Clusters Cambridge CB2 3QH University
York Y043 CB 3Q York, America
Directly new and unused for the 20
and 2000 84 C 100-200 Tel: 0432
0432 10 10 10

CEM 84 COMBAT Delivered
Program Full Text/Editorial Review
Peer-reviewed Entry List Details
Awarded Chapter Allotted Sections
Intermediate/Advanced Post 12/00
+ 1980 edition history included
Call 844-344-3444 or 844-344-3444
Newman, Australia, Co. (Australia, N.S.W.)

750-255-5455/CHANGCHENG Corporation, 404
Hudson Street, WFO, 32, Hanoi, Vietnam
Tel: 84-4-3749444-3333, 3333, 3333

CEMEX MILLER is a superb little new adventure for CEMEX. Set on a village island, open station with large windows and many antennas to enter. On average for 18 hours. Room 18. Warwick Road. Chesham, Bucks. Hemel Hempstead, Bucks. 1991.

[illegible]

COMMODITY: 60-card program on the play is, from cartridge (25) and on disc, with some very powerful (10), also address book program (5). Please refer to (441)

CBH 84-1845 *East Cove F Series*
8000 Magnificent *Juniper*, *East*
Cove *Juniper* *Series* *Juniper* *Series*
about 1900 and family used at all
times except for 1900 and 1900. Tel. 6000.
1973, 1974

HR Plans Cost Effect **Proven** **Paper**
Just weekly C&M & Quarterly 12
month Easy Script Easy Read
translation to HRM vs 1 vs 2
months and finally cost C&M the
cost of HRM.

COMMERCIAL ADVERTISING is run by
at VIC 20. Detailed conditions of sale
are from VIC 20 Tel. (0400) 202 202
(0400) 202 202.

©2001 HGT, LLC. All rights reserved. HGT and HGT logo are registered trademarks of HGT, LLC. All other trademarks are the property of their respective owners.

COMBINATION In plus-2000 variable plus Japanese games there are two words and two red: **COMB** and **COMB** (COMB, COMB, COMB).

©2004-2005 0-4 CCM Creative
Services Publishing. Material
may not be used for other
than legal purposes. All rights
reserved.

CHIEF But the students ultimately agree that saving the program, *Star Trek: The Motion Picture*, is the right thing to do.

© 2004 by Cambridge and Software House
and their agents, service and distributors
located in the United States of America
Cambridge, Massachusetts 02142



WISCONSIN
 PHYSICS 112 requires 3 hours of
 lecture and 3 hours of laboratory (120
 hours total) during the semester (120
 hours total) during the semester (120
 hours total)

REC: DE CINE SONT LES MEILLEURES FILMS
DE LA SEULE ANNEE 1999. L'ANNEE 1999
L'ANNEE 1999. L'ANNEE 1999. L'ANNEE 1999.

100-200 mg per day
 100-200 mg per day
 100-200 mg per day
 100-200 mg per day

Learning Goals: **Identify** the major components of a computer system.
 1. **Identify** the major components of a computer system.
 2. **Identify** the major components of a computer system.

1. **Introduction:** Brief overview of the research topic and its significance.

PRIVATE ADVERTISERS ONLY

PLEASE WRITE YOUR COPY IN CAPITAL LETTERS ON THE LINES BELOW

[illegible]

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

THE REVIEW

Figure 10.10: A plot of the function $f(x) = \sin(x)$ for $x \in [0, 2\pi]$. The function is periodic and oscillates between -1 and 1.

CLASSIFIED DEPARTMENT
COMMODORE HORIZONS
12-13 LITTLE NEWPORT STREET,
LONDON WC2R 3LD

Average 1993 Connections: 16,000,000.00

Micronet modems make connections

Solve the puzzle and you could be one of three winners of Micronet Modern systems for the Commodore 64. Tony Roberts sets the problem — just connect up and you could win!

MICRONET IS offering over 3500 words of connecting equipment at prices in this month's competition. A pair's microphone, communications controller and modem are on offer to the three winning entries.

The members of the Mail Node more club have all clubbed together to establish a network connecting all their machines providing all the computers are switched on. It's quite possible to send a message from any individual to any other. Even though any one message can be sent no more than 150 times, just as long as it encounters another powered-up computer, that computer will re-broadcast the incoming message until the message reaches its destination. Even a switched-off computer doesn't get in the way — an incoming message is well-received through just as long as the total journey between the powered-up computers is not more than 600m, it'll get there.

All were well until one day Peter and John both left their machines switched off suddenly no-one could get a message through in three or four days. It's a map showing the network where do the two go to find?

Simply tell us the code letters for the path between the two go to find? and, assuming this or better in an age, winning and original manner in 3000 words or less. "I would like to join up with Micronet because..."

The Micronet service for the Commodore 64 will open in August. Micronet already has 30,000 users who enjoy the facilities of electronic mail, bulletin boards, daily computer news and features, downloadable software and convenient shopping for their

computer keyboards.

Micronet is brought to your computer screen via Prestel and your telephone line. Its 30,000 'pages' of information are copied on night modems from computers throughout the country.

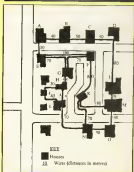
Using your 64 and the Micronet communications controller, designed by OLI Ltd, designers of the award-winning VTX-8000 modem, you'll be able to download commercial software at up to 30% less than retail prices, play the 1000-player game Starline, and send and receive electronic messages, and more. For more details see the interview with Micronet's Ian Rock in this month's Profile section.

The winners of Jane's Melbourne House competition will each receive a copy of *Happy Home* or *Home One* (new for the 64). They are: Richard Taylor, Penwortham; John Connolly, (Surrey); M N Daniel, Colchester; J Owen, Basingstoke; Mark Bacheler, Bournemouth; Nicolas Morris, Tooting; Michael Dicks, Uxbridge; Phil Kennedy, Lancing; Gregory Morris, Ashford; M H Taylor, Romford; Jay Nicholas, Torquay; B Wilson, Bournemouth; Anthony Papp, Brentwood; Lois Phillips, Aylesbury; N K Francis, Chesham; Gena Harris, Staines; Michael Bailey, Sutton Coldfield; Mike Schmidt, Ilford; D Gamble, Dagenham; R C G Cox, Croydon.

The winner of the *British Maze Craquel* competition is Edward Pope from Taverham.

The winner of our special *Commodore Show* competition is Howard Kinross, of Oldham Green, London. Howard's prize is a 1541 disk drive.

Send your answers to Competition Corner, Commodore Magazine, 12-13 Little Newport Street, London WC2E 8JH — to arrive no later than the last working day in the month on the cover of this issue. The name of the winner, and the solution to the puzzle, will be published in this issue after next.



IN
YOUR
SHOPS
FROM
5th MAY

There has never been a
family game like

BATH TIME

BATH TIME is a new arcade family game
and is guaranteed to keep you feeling
warm and bubbly.



FAMILY ARCADE ACTION

FOR COMMODORE 64

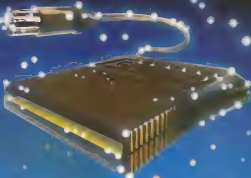


The object is to protect a swan and a fish happily living in their bath. If the water level in the bath gets too high the swan will swim away; if it gets too low, the fish will die - but watch out for the elephant and the little boy.

R.R.P. £7.95

PSS

FUN WITH SPEECH 64!



Speech Synthesiser for the Commodore 64

SPEECH 64 lets you talk immediately with your Commodore 64. Its vocabulary and extra BASIC commands, available at only £29.95, **SPEECH 64**'s advanced features will give you, your family and friends lots more fun with your computer! Its sister unit, **μSPEECH** — for the Sinclair Spectrum — is a smash hit in the UK and over 10 other countries, and has **BAFTA** awarded the CTA Product of the Year accolade.

SPEECH 64 is easy to use! It needs no software to be loaded, it does not steal RAM from the BASIC operating system or stop on-line style action.

With extended BASIC commands like SAY and its Text to Speech facility **SPEECH 64** can be programmed in plain English, just like the SAY "to say anything you want!"

You can choose from two different voices, each with programmable intonation, and other commands control the voicing of keys as they are pressed — a useful educational aid for young children.

SPEECH 64 includes a comprehensive, fully documented, in and out line full instruction manual. Watch out for **SPEECH 64** at all computer retail outlets nationwide — or call for details from **Currah** or **Computer 101**.

CURRAH

Computer Components Ltd

To: SPEECH 64 Offer, P.O. Box 1, Garshead, Tyne & Wear, NE26 5JH

From: Supply: SPEECH 64 unit at £29.95 incl. VAT P.T.

Name (please print): _____

Address (please print): _____

Telephone (please print): _____

Comments (if any) (please print): _____

or deliver by **Personal Delivery** Call for the **FREE INFORMATION**

Special credit card order form enclosed (please print): _____

Order Confirmation No. 100 0000 _____